THE ENGINEERING AND MINING JOURNAL.

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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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INTERNATIONAL COMMITTEE ON THE NOMENCLATURE OF IRON.

THE International Committee on the Nomenclature of Iron, appointed by President HOLLEY, of the American Institute of Mining Engineers (inadvertently omitted from the report of the June meeting in last week's issue), consists of Messrs. TUNNER of Austria, WEDDING, of Prussia, BELL, of England AKERMAN, of Sweden, GRUNER, of France, and EGLESTON and HOLLEY of the United States.

A BILL FOR THE PREVENTION OF FRAUD IN THE ORGANIZATION OF MINING AND OTHER COMPANIES.

THE enormous sums which have been drawn from British pockets by such mines as the Emma, appear to have purchased some wisdom at last, for we note, in a recent number of *Capital and Labor*, that a Bill has just been presented to Parliament by Mr. D. CHADWICK, Sir H. M. JACKSON, Mr. S. LOYD, Mr. P. RYLANDS, Mr. HOPWOOD, and Mr. B. WHITWORTH, which proposes a searching examination into the circumstances attending the floating of any company. Vendors are to give an account as to how and for what purpose they became possessed of the property, and the material contents of all contracts made prior to the issue of the prospectus are to be published. There is also provision for the issue of an account showing every payment made or incurred in the formation of the company. Should this Bill pass, the professional promoters will have to exert their ingenuity in some other direction, and it is to be hoped a source of risk and loss more subtile and injurious than "horsebacks" or "faults" in the vein, would be, at least partially, avoided.

Such disgraceful operations as the floating of the Emma, Flagstaff, Caribou, and a long list of other less prominent mines, would doubtless have been rendered almost impossible, had the vendors been obliged to show their hands; but we are not so sanguine as to expect such a law to put a stop altogether to these nefarious transactions.

The selling price of a mine is always made to depend upon its value as certified to by experts. And so long as the vendors can convince capitalists that they are buying for five millions of dollars a mine worth ten millions, the investors will care little for how much or how little the mine had previously been sold.

No one can desire more earnestly than we do, to see some effectual preventive for the gross deception practised on capitalists in mining investments; but we do not believe an effectual remedy can be found in any special legislation, and, indeed, there is no more occasion for a special law to protect this class of investors than there is for those who buy government or railroad bonds, or any other class of security (?). The only real security for investors, is in the exercise of common sense and ordinary business caution.

It is quite possible in every case to get full and reliable information about any mining property, and the directors should be made responsible for the accuracy of the statements made in the prospectus.

If it were made their duty to see that such statements are well founded, and that they, individually, were made responsible in the case of their neglecting to furnish full and reliable information with regard to the property offered, we have no doubt such a degree of caution would be exercised as would, in most cases, prevent the disposal of worthless property. As it is, in the majority of cases, the directors are simply ornamental figure-heads, who are too often bribed by the gift of fully-paid stock to advocate the claims of the property, and who feel little or no responsibility for the statements made in the prospectus. Make them responsible, and leave to them the choice of means for ascertaining the value of the property. The greater the simplicity and directness of the terms of the law fixing where the responsibility rests, the more effective will it prove.

NEW PUBLICATIONS.

PRACTICAL TREATISE ON THE CONSTRUCTION OF IRON HIGHWAY BRIDGES, FOR THE USE OF TOWN COMMITTEES, together with a short Essay upon the Application of the Principles of the Lever to a Ready Analysis of the Strains upon the more Customary Forms of Beams and Trusses. By ALFRED P. BOLLER, A. M., Civil Engineer, Member of the American Society of Civil Engineers. 8vo., pp. 144. Price, $2.50. New York. JOHN WILEY & SONS.

This book, as its title implies, is mainly intended for the guidance of public officers to whom is intrusted the responsibility of erecting iron bridges, although it is not without interest to the professional bridge builder; and to engineers, not expert in this branch of the profession, but who may be called upon, as is often the case, to exercise some supervision of bridge contracts, it will prove invaluable.

The author has been most felicitous, in so far as he has departed from the beaten path of bridge literature, to address his ready pen to the correction of a flagrant wrong, too generally condoned, and we have great pleasure in testifying to the graceful and thorough manner in which he has performed his task. It may not be amiss to say to those of our readers who are unfamiliar with the "ways that are dark and tricks that are vain" of highway bridge lettings, that the most pernicious practices have crept into or, more correctly, have grown up with the system. Thus, in the absence of any legal restriction, experience has shown that the commissioners who control the letting of such work, rarely evince a realizing sense of the degree of strength necessary to insure the safety of the bridges which they build, or, indeed, guard in any way against the wiles of unscrupulous contractors who may choose to impose upon their ignorance of technical details.

As a natural consequence, a disreputable class of bridge builders has been called into existence, who, putting into the structures which they erect but little, if any, more material than is necessary to insure stability when no accidental load is imposed, are thus enabled to largely underbid good work.

The statements by which these contractors (not inaptly known as "tin-pan" bridge builders,) commend their wares, are in many cases simply appalling, not only to technical knowledge, but even to common sense. Few Commissioners could be induced to believe, that a narrow piece of inferior sheet iron spanning a mill-race or ditch a few feet in width, would constitute a stronger foot-way than a stout wooden plank—yet a precisely similar assurance that iron bridges are necessarily stronger than those of wood is received unquestioned—and while, for their own use, they would not purchase the cheapest saw, horse, or plough to be found, without regard to the service required, they do, when the public purse and safety are involved, set aside practically all considerations of merit, and make the first cost of the bridges which they buy the paramount consideration. To such an extent has the technical obliquity of Commissions resulted in the use of inferior material, bad workmanship, and the employment of one pound of iron where two or more are fairly required, that there are comparatively few highway bridges in the United States, except in cities, and not always in those, which could safely withstand the load of a dense crowd of persons—a test to which any one of them is obviously liable to be subjected.

Mr. BOLLER is deserving of the very highest praise, in having so clearly pointed out the means of guarding against the abuses which we have briefly mentioned, that public officers, who read what he has written, cannot err through ignorance. He treats of the metallurgy of iron sufficiently to show what classes of metal are suitable for bridge work, and explains how they may be tested in a simple manner; he lays down plain rules for the inspection of timber; devotes considerable space to the more essential matters of detail, notably to the proper loads and factors of safety for different cases, the strength of ties, struts, beams, and stringers, the proportions of pins and eyes, the best arrangement of the parts comprising the floor, and gives some very substantial reasons in support of a preference for pin jointed work, in distinction from that on which the joints are riveted; he embodies his suggestions finally in a concise specification, applicable with slight modifications to all ordinary cases, and points out the best means to be employed to insure conformity with its provisions. The author devotes the concluding pages of his work, to the analysis of strains in beams and trusses. There seems to exist a deplorable antagonism between the scholars who write our books, and the engineers who build our bridges, as to the methods of computing strains, the former generally preferring that which is complicated and profound, and the latter that which yields results with a minimum of labor. We confess to some sense of disappointment, that the author, a practical bridge builder, has followed closely, in this portion of his treatise, the lead of those writers whose theoretical knowledge is unleavened by actual experience.

It seems to us that in showing how strain is disposed through the different members of a truss, that method which consists in writing the algebraic values of the fixed and moving panel load, w and W, directly upon the parts of the diagram under consideration, is preferable to any amount of explanatory text, and that in the actual computation of the strains, the tabular method, commonly employed in bridge building offices, is the most intelligible and concise. At all events, we feel sure that had the author employed these methods, the twenty-five pages which he devotes to the analysis of a few prominent trusses, would have more than sufficed for the investigation of all the forms of bridges in ordinary use.

His analysis of the bowstring bridge, while less complicated than any other which we remember to have seen in the English language, does not compare

in simplicity with RITTER's method of investigation.* It was not the author's object, however, to write a book upon bridge strains, and we may repeat that his advice and suggestions, to persons controlling highway bridge lettings, are, in all respects, of the very best. The publishers are entitled to a word of commendation for the tasteful manner in which the book is presented, and the execution of the numerous engravings with which it is illustrated.

THE RAILWAY AGE.—Chicago is well supplied with engineering papers, but as there is, doubtless, always room at the top for a new one, we welcome the *Railway Age*, which appears to possess the essentials of a useful and successful journal.

The managers are gentlemen who have had large experience in railroad management, and are, therefore, well qualified—and it is only such who are qualified—to conduct, intelligently, a paper devoted to this interest.

The *Railway Age* is a twenty page weekly paper, (price, $4.20 per annum), of very attractive appearance, and its contents are of such excellence, that it at once takes a position among the best railway papers of this country. We wish it success.

CONVERSAZIONE OF THE INSTITUTE OF MINING ENGINEERS.

Special Report of the Engineering and Mining Journal.

THE USE OF NATURAL GAS IN PUDDLING—DURATION OF GAS WELLS, ETC.

THE subject of the use of petroleum gas in iron manufacture was considerably discussed at the meeting held at the rooms of the Centennial Committee of the American Institute of Mining Engineers, on the evening of July 5th. Mr. J. D. WEEKS, of Pittsburg, who has had considerable experience in the use of natural petroleum gas for puddling purposes, gave a resumé of some experiments which he had witnessed in works near Pittsburg. He first spoke of the use of natural gas at Freeport, where, after its introduction, it was found to make, from a very ordinary pig iron, plates of a quality which could be used for purposes for which charcoal made iron had hitherto been exclusively employed. He then spoke of a well, situated about nineteen miles from Etna Borough, near Pittsburg, which was found to give out such immense quantities of gas that the experiment was tried of bringing it in pipes to the mills of SPANG, CHALFANT & Co., and GRAFF, BENNETT & Co. The well was tubed with pipe of 5¼ inch diameter. The pressure of the gas was never satisfactorily determined, it being supposed to be about 300 lb. to the square inch; but when a cap was screwed down on the top end of the pipe, the pressure rose so rapidly that, in a short time, it became almost enough to blow out the tubing, and so the cap was removed. The pipe used to convey the gas to the mills was 6¼ inches in internal diameter. It was buried three feet underground to keep the water, which is found mixed with the gas, from condensing and freezing in cold weather. When the line was first laid, the pressure of gas at the mills of SPANG, CHALFANT & Co. was only six pounds per square inch, while at the other end of the pipe it was about 150 pounds. A partial explanation of this great difference in pressure was soon found in the shape of four pieces of pump logs, which had been driven into the pipe at different points by, it is supposed, suspicious coal miners, who looked upon the use of this gas in iron making as being highly detrimental to the business in which they were engaged. After the removal of these plugs, the pressure of the gas at the works went up to 17 pounds per square inch, while it had gone down to 80 pounds at the well. Analyses made of the gas by Prof. SADLER showed it to be largely composed of marsh gas, with a very small proportion of the illuminating hydrocarbons. (See ENGINEERING AND MINING JOURNAL, Vol. XXI., page 269.) When burnt, however, the gas has considerable illuminating power, which Mr. WEEKS said was, perhaps, due to the sodium salts contained in it. A special furnace was found necessary to burn the gas in. That adopted by SPANG, CHALFANT & Co., was what might be called a continuous regenerative furnace, in which the air and gas, before being burned, were heated in tubes placed under the sole of the furnace, they being heated from the outside by the products of combustion from the furnace, which were made to pass from the bridge around these pipes on their way to the chimney. Efforts had been made to measure the quantity of gas used in puddling, but, owing to the fact that the ordinary meters were made for measuring gas at very small pressures, the results had not been satisfactory. From what results had been arrived at, it was estimated that 4,000 cubic feet of gas, at one pound pressure, were necessary to puddle a ton of iron. It was found that the use of a little coal, in connection with the gas, made the furnace work more satisfactorily than with gas alone.

Dr. T. STERRY HUNT then spoke of the occurrence of natural gas, both in petroleum-bearing districts and in rocks of other geological formations. He also spoke of the use of petroleum in heating scrap iron, at the Quinsigamond Works at Worcester, Mass. This furnace, which was invented by Dr. EAMES, is so arranged, that a current of superheated steam and air meets a thin film of petroleum while trickling down an inclined plane. The steam and air decompose and vaporize the petroleum, which mixes with the air, and is burned in the combustion chamber of the furnace. The heat produced by this arrangement was at first so great that it melted the lining of the furnace, but when this difficulty was remedied by the use of more refractory materials, the furnace worked very satisfactorily. The fuel previously used was charcoal, costing ten cents a bushel, and it was found that the petroleum, at two dollars a barrel, made an equally fine grade of iron at a cost one-third less than that when the charcoal was used for heating. Mr. J. B. PEARSE then said that the great difficulty which had hitherto attended the use of petroleum gases for puddling iron was the impossibility of obtaining oxidizing flames with it. No apparatus yet devised had been able to so thoroughly mix the air and the heavy gases as to burn them to carbonic acid. The result was that in puddling phosphoric iron with these natural gases, the amount of phosphorus in the finished iron was much greater than when coal is used for fuel. Some experiments, which he had lately been carrying on at the mill of SPANG, CHALFANT & Co., in puddling iron with gas, demonstrated the truth of what he had just said. The pig iron contained 0·567 of phosphorus, which, when puddled in an ordinary furnace with coal, yielded a finished iron containing 16 per cent. of phosphorus.

With a Robertson gas furnace, which has a series of pipes occupying one-half the usual grate area, in which the gas and air used in the furnace are heated by a small portion of the same gas, the amount of phosphorus in the finished iron was 0.36 per cent.

To puddle 500 lb. of iron, 1,563 cubic feet of gas, at a pressure of 2 lb. per square inch, were used, the operation lasting about an hour and a half. The great heat which the iron has when drawn from this furnace makes it much easier to expel the cinder than in the case of coal-heated iron. The finished iron is not so strong, however, as that made in the coal furnaces, owing probably to the excess of phosphorus which it contains. When bars of the gas-made iron were bent cold, they broke when not curved more than 12°, while the iron made from the same pig, but in coal furnaces, bent double without any signs of cracking. The loss of weight in puddling was 3¼ per cent. in the case of the gas furnace, compared with 7 per cent. in the coal furnace. Mr. PEARSE said that the most favorable results were to be anticipated when about 8 bushels of coal per heat were used in connection with the gas, instead of using 30 bushels of coal alone to do the same heating as was now usual. The gas should always pass over the burning coal instead of through it. Mr. PEARSE also spoke of a furnace at Lynchburg, Va., in which the gas is burned by means of tuyeres or nozzles, which are arranged on the same principle as the oxyhydrogen blowpipe.

The furnace was puddling, at the time Mr. PEARSE saw it, on a mixture in equal proportions of Isabella pig iron and old car-wheel scrap. A small quantity of coke was used in addition to the natural gas. Hammer scale and mill cinder were used in the bottom of the furnace, and the weight of puddle bars always exceeded the amount of iron charged into the furnace. Speaking of the chemical constitution of the natural gases, Mr. PEARSE said that the analysis had shown the Pennsylvania gases to contain varying proportions of free hydrogen. The maximum amount of this element found is 12.5 per cent., with 45 per cent. of nitrogen. The gas used at the mill of SPANG, CHALFANT & Co. contains 6.5 per cent. of hydrogen. The specific gravity of these Pennsylvania gases varies in proportion to the hydrogen which they contain. They are heavier than air, and can, like carbonic acid, be poured downward from one vessel to another. The heaviest of the natural gases is that found at Fredonia, N. Y. The gas supply of Erie, Pa., which a few years ago was so abundant, has now become very small, and in most of the wells has to be pumped up. It is found that in those wells which give out gas freely the pressure varies, its maximums during the day occurring at about 9 A.M. and 4 P.M.

When gas wells are sunk in new districts their flow generally proceeds with regularity; but when others are sunk in the same neighborhood, they are apt to cease operating in from six months to three years.

A very interesting experiment tried in Erie some time ago was described by Mr. PEARSE. It consisted in forcing natural gas at a pressure of 10 lb. per square inch into a blast furnace. The gas was introduced along with the blast through the tuyeres, but without having any appreciable effect on the yield or quality of the iron made. The fuel proper consisted of charcoal, or a mixture of charcoal and coke. Mr. PEARSE mentioned the very interesting fact that sixty oil wells had been sunk in the Pennsylvania Big Sandy District by means of the direct pressure of gas from the first well sunk. This method of using gas like steam in engines, and burning it as it escapes from the exhaust pipes, seemed to some of the foreign gentlemen present an astonishing illustration of the prodigal way in which Nature's stores are used in this country.

*FORMULÆ FOR BOWSTRING OR PARABOLIC-TRUSS STRAINS.—The following formulæ, deduced principally from RITTER's equations, are applicable to parabolic trusses, in which the panels are of equal length, and in which the lacing consists of verticals and diagonals, and will be found, by those who choose to accept them upon faith, to afford easy solutions of the strains in this class of structures—the investigation by the methods commonly defined in text books, being at best, somewhat discouraging:

Let w=bridge weight per panel.
w_1=moving load per panel.
l=length of span.
h=depth of truss at center.
b=length of one panel.
n=number of panels.
y=length of any segment of the bow under consideration.
d=length of any diagonal under consideration.
x=difference in length between any vertical under consideration and the end vertical.
H=maximum strain upon horizontal tie.

Then $H=(w+w_1)\frac{nl}{8h}$

Maximum strain upon any segment of the bow $=\frac{Hy}{b}$

Maximum tension upon any diagonal $=\frac{nw^1}{8h}d$

Maximum tension upon each vertical in a through bridge $=w+w1$.

Maximum compression upon any vertical $\begin{cases} \text{in a through bridge} = x\left(\frac{nw_1}{8h}\right)-w \\ \text{in a deck bridge} = x\left(\frac{nw_1}{8h}\right)+(w+w_1) \end{cases}$

INTERNATIONAL EXHIBITION OF 1876.

Special Report of the Engineering and Mining Journal.

ADMISSIONS FOR THE WEEK ENDING JULY 18, 1876.

Date.		Paying Visitors.	Press, Complimentary, and Exhibitors.	Total Visitors.
Previously reported.....	.....	1,395.219	595,048	267
July 12.....	55th Day..	20 375	10,311	30,686
" 13.....	56th " ..	18,352	10,066	28,418
" 14.....	57th " ..	18,333	10,254	28,58
" 15.....	58th " ..	16,057	10,027	26,08
" 17.....	59th " ..	18,270	10,367	28,63
" 18.....	60th " ..	19,184	10,111	29,295
Totals.....		1,505,790	656,184	2,161,974

DANISH COAL.—An experiment has just been made in Prussia with the importation of coal from the Danish Isles. The first cargo has been shipped to Stettin, from the island of Bornholme, which possesses extensive coalfields, the produce of which is, however, not sufficiently matured to display the heating power of ordinary sea coal. It rather resembles lignite, or brown coal, but, being handy and easily raised, it promises to be found useful for a good many purposes in Northern Germany. A good deal of brown coal is generally used in Germany.

ADDRESS OF MR. FRANKLIN B. GOWEN, BEFORE THE AMERICAN INSTITUTE OF MINING ENGINEERS, JUNE 20TH, 1876.

MR. PRESIDENT AND GENTLEMEN: It has been made my pleasant duty to welcome you to the City of Philadelphia, but in so doing I shrink, with some natural reluctance, from appearing before an audience so much better fitted than I am to cope with the subjects which are usually presented to your association, and I can assure you that no trembling neophyte, first venturing within the groves of the Academy, or walking, with sacred reverence, in the gardens of Plato, felt more natural dread at the consequence of his own temerity than I do in appearing before an audience composed of gentlemen belonging to a scientific society, of which I am but too sensible that until now I have been a member only in name.

In olden times, upon entering a temple sacred to the worship of any deity, it was customary to lay some offering upon the altar, and, in following this custom, it will be my duty, before entering upon the more pleasant part of the task which is assigned me, to call your attention to a subject with which I have been somewhat familiar, and which is entirely within the scope of your investigations, in the belief that I may throw out some hints or some suggestions of a process that may be fully developed by some of you, and eventually lead to the introduction of that which may be of service to the human race.

The satirist who described the philosopher whom he met with, as engaged in the process of extracting sunbeams from cucumbers, probably uttered a truth, when he was dealing only in what he supposed to be the perfection of satire, for it is now known to all that the vegetable growth of the primeval world, stored up in the shape of carbon, the sunbeams which shone upon the dawn of creation, the product of which, now deposited in the recesses of the earth, is that mass of fuel, without the use of which the civilization of the world now would cease to move with its advancing strides.

In connection with the development of this fuel I desire to direct your minds more particularly to anthracite coal, and to ask the attention of the gentlemen who are charged with determining the proper economical methods of extracting the wealth which Nature has stored up for us, to the great waste, which has heretofore characterized the mining of anthracite coal in Pennsylvania, and to a process which has recently been discovered, for the utilization of that waste. Most of you know, that in the preparation of anthracite coal for the wants of the market, it is broken into different sizes, by which a vast amount of culm is produced, which heretofore has been considered entirely useless, so that there is now left in the districts in which I am particularly interested, almost 40,000,000 tons of this waste material lying in huge mountains, some of which, if they remain to future ages, would probably puzzle the geologist to account for. This vast amount of fuel, containing in itself as much carbon as the most merchantable coal, has heretofore been considered useless. Several attempts have been made to introduce the French and Belgium methods of converting it into artificial fuel, by admixture with gelatinous substances, and compression by mechanical means, but the cost of this process has been at least one dollar per ton, and heretofore, except for domestic purposes, and at shipping ports, where there is an accumulation of this dust near to market, they have been practically useless for any commercial purpose. The attention of the company which I represent, and of its general superintendent, Mr. JOHN E. WOOTTEN, was called to this matter some months ago, and Mr. WOOTTEN has invented a plan whereby this waste fuel, heretofore thrown away as useless, can be used in making steam, both in stationary and locomotive engines, without any admixture with other substances, and without any compression into blocks.

The coal dust or culm, in its natural state, is thrown into the furnace, and a result obtained, which is nearly, if not quite, equal to that which is obtained from merchantable coal itself. In order to secure perfect combustion of this fuel, on account of the closeness with which it packs, it is necessary that the draught of air should be greater than that required for burning larger sizes of coal. The ash-pit beneath the fire is entirely closed, except at one place which admits the pipe through which the blast is forced. The bottom of the fire-box, instead of being a grate, is composed of perforated sheet iron, resting upon supports sufficiently strong to sustain it. The blast is produced by a small jet of steam forced through an orifice not exceeding the twentieth part of a square inch. This jet of steam, blown through the orifice, is introduced into a pipe which might be described in shape like the two frustums of a cone, joined at their narrow diameters. The vacuum produced by this blast, draws after it an enormous volume of air, which furnishes sufficient oxygen to consume the finest coal dirt. The pipe leading the jet of steam to the orifice, is controlled by a small valve which is held open by a spiral spring, and whenever the pressure of steam in the boiler rises to a certain height, say one hundred pounds to the square inch, it counteracts the force of the spiral spring, closes the orifice through which the steam escapes, and shuts the blast off completely from the fire; and whenever the steam in the boiler falls below the pressure of seventy pounds to the square inch, the strength of the spring, overcoming the resistance of the steam, opens the valve, and the blast is again introduced. There are generally one, but sometimes two or three, of these pipes introduced beneath the fire-box; and the inner surface of the larger diameter of the cone, which extends beneath the fire, is closed by a suspended valve which falls back whenever the blast ceases; so if there should be two or three of these pipes entering beneath the surface of one fire-box, and anything should happen to one, whereby the blast would be suspended, the valve would fall, and close the orifice so as to prevent the escape of the blast entering from the others. The whole apparatus is therefore very simple, and easily understood. We have obtained, after several months, not only of experiment, but of absolute trial, in stationary engines, a result from this waste fuel fully equal to that obtained from the most expensive quality of merchantable coal. The next trial after that with stationary engines was made upon a locomotive, and I think I may safely say that it, in burning, has proved equally successful.

The fire-box of the locomotive engine is made precisely like that of the stationary boiler, the bottom being of perforated sheet iron. Of course you can see that if the ordinary exhaust of the engine was used to create the draft, its intensity would be so great as to draw up all the finer particles of culm and carry them through the smoke-stack. The exhaust is, therefore, practically abandoned, except as I shall explain hereafter, and the blast produced by the steam jet is introduced beneath the surface of a perforated plate, in the locomotive, the ash-pan or fire-box of which is closed at all places except that through which the blast enters. In order to utilize the heat of the steam escaping from the valves, as well as to prevent the intensity of the blast that would be produced by the exhaust, the steam, as it escapes from the cylinders, is taken through two series of pipes, one of which is in front of the boiler beneath the smoke-stack, and the other is placed horizontally upon the surface of the boiler, both being united and forming a condenser. The water pumped from the tender of the locomotive passes on its way to the boiler through this condenser, and the steam is utilized to heat all the water that enters into the boiler, and thereby to save the amount of fuel that would be required if the water entered the boiler in its cold state. After this the steam is taken into an annular chamber around the center of the smoke-stack, closed at the top, and, finding no vent there, is taken—at a distance of two or three inches from the top—by a six-inch pipe, downward through this chamber and injected from below through a smaller orifice into the smoke-stack itself, thereby producing not a fitful and irregular draught like that of the exhaust, but a continued steady blast, which is essential to the combustion of this fuel in the locomotive engine. The water produced by the condensation of the steam escapes through a pipe leading downward from the bottom of the annular chamber. The experiments with stationary and locomotive engines having been successful, the next experiment will be made upon steamships, and you can readily see the difficulty that we may here encounter from the fact that so much more fresh water will be required on account of the increased quantity of steam used for the purpose of producing the blast of air. I can see, however, that this may be overcome, and I trust that no difficulty may attend the introduction of the process on board of steamships.

And now I should like to suggest to the members of this Institute, as something they may seriously think of, whether this vast amount of fuel, this forty million tons, heretofore comparatively worthless, and which, up to this time, its owners would have been glad to have given away for nothing—whether this vast amount of fuel cannot be made use of for the purpose of smelting iron ores in the blast-furnace, or of heating and puddling iron in the rolling mill. In the first place let me call your attention to this fact, which I omitted to state when I spoke of the results of the experiment for producing steam, that from the ordinary coal dirt, such as is usually thrown away at the mines, we obtained a heating power of such intensity that one pound of coal dirt converted eight and a half pounds of water into steam; and, further than that, it is remarkable that from some piles of coal dirt that have been exposed to the atmosphere for over forty years, some of them probably mixed with pieces of slate, which in that long time had crumbled into dirt, and therefore made the fuel more worthless than it would be if it had been nothing but pure coal, we obtained a heating power sufficient to evaporate six and a half pounds of water with one pound of fuel. Now, with such a result obtained, why should not this fuel be used in the manufacture of iron? Of course, with the reverberatory furnace, it could be used for generating gas. But I wish to throw out a suggestion to those who are better able to cope with the subject than I am, that probably some process could be adopted whereby iron ores of superior chemical qualities, but containing so small a percentage of pure iron as not to bear long transportation, might be reduced into the form of powder, and relieved of such impurities and dross as are capable of mechanical separation, so as to produce an ore elevated to the standard of 60 or 65 per cent. of metallic iron, which would bear the cost of transportation, be carried to the coal regions, there to be mixed with coal dust and some proper flux, and by compression formed into a block, to be thrown into a furnace, in order to produce pig iron at a very low cost.

Having thrown out these suggestions in the hope of attracting your attention, and leading some of your members to the solution of the problem which I have proposed, I now turn to the more pleasant part of the duty, which has been assigned me to-night, and welcome you most cordially to the City of Philadelphia. Here in this old Quaker City, we have, as you know, one of the most perfect systems of common schools in the country. We have institutions of learning, respectable on account of their age, and venerable for the high character and great attainments of the professors who adorn them.

We have academies sacred to the propagation of a taste for art and for music, and yet I will venture to say that no school nor institute, nor academy, is of greater importance to the development of the resources of the State of Pennsylvania, and to the prosperity of the City of Philadelphia, than the institute I now have the honor of addressing. The prosperity of this State and its development, not only in manufacturing industry, but in that commerce which necessarily must be the attendant upon success in manufactures, is dependent upon the mining industries within her borders.

Long since, I am glad to say, has the time gone by, when it was believed that an eminently practical man armed with muscle, but devoid of brains, was alone essential to the solution of that great problem of how to contend with Nature, in order to wrest from her embrace the mineral wealth that she has stored up beneath the surface of the earth, and it is now admitted that muscle must be directed by brains, and that scientific attainments of the highest order, such as are cultivated by the members of this Institute, are the first requisite in him who undertakes the charge of any important mining enterprise. Excepting those of the Egyptians, the earliest record we have of the use of letters was when the Almighty Himself presented to Moses the graven tablets of the law, and it was not until thirty centuries after the delivery of the law, that human ingenuity discovered the art of printing by which that law itself and all the arts, have been conserved to future time. But it was reserved for the present age and generation to produce the genius and skill which enables us to read that great book of nature, which is opened for the first time to reveal the hidden secrets of creation. A book not written by man or by human agency, not engraved on marble tablets, nor recorded in hidden characters, but in the long processes of the ages inscribed by the hand of the Almighty Himself, and reserved by His wise decrees, only to be unfolded when in the ever-advancing development of the human race, a time would come when His people could open its leaves, read its characters, and interpret those innumerable chapters of the History of the Creation, written in everlasting characters, by the hand of God Himself, and embracing those great Cycles, each of which is, in its turn, composed of untold æons of recorded time. You are the high priests of that temple, before whose altar this book is opened, and from whose steps its meaning is revealed and explained. Without your knowledge, and without your skill, we should be groping in the mazes of a labyrinth, from which no clue could extricate us. I bid you then God speed in your good work! and I bid you a glad welcome to this city on this Centennial year, well knowing that among those interested in the results of your genius, your learning, your industry, and your skill, there is no community more benefited than the City of Philadelphia, on whose behalf I now welcome you within her borders.

PRESERVATION OF TIMBER FOR MINES.—HERR O. KOUG packs the timber, cut in proper lengths, in a vertical position in an iron reservoir, provided with a tight fitting cover. The vessel is then filled to about three-fourths of its capacity with a solution of the carbolate of soda. Into this he leads live steam, which speedily brings the liquid to the boiling point. The access of the steam is continued until, by its gradual condensation it has filled the vessel to its full capacity. The wood is then allowed to remain in the hot liquid for some hours; this is then drawn off, and the wood washed off with a dried steam jet.—*Berg- und Hüttenmännische Zeitung* XXXV., 1787.

A PARTIAL RE-CONSTRUCTION OF A FURNACE CRUCIBLE WHILE IN BLAST.*

By J. H. Bramwell, Quinnemont Furnace, West Virginia.

THE following experience in rebuilding a furnace crucible, while in blast, may not be wholly uninteresting to some, notwithstanding its purely practical character. Few are aware of the frequent calls made on a furnace manager's skill and ingenuity, to meet the irregularities which present themselves with kaleidoscopic variations in the operations of furnaces. Unfortunately, the methods pursued in overcoming these practical difficulties, are too seldom recorded, and much valuable information is lost that could not fail to be of value to many, and to none more so than the educated technical manager, with a limited practical experience, who, without a literature or record of any kind to refer to, finds himself, in times of emergency, dependent and looking for assistance from those whom it is his province to instruct and direct, and only too frequently heeds the cheerful croak "She's gone up," which, once uttered, finds a ready chorus on all sides. With positive data, however, that like difficulties have been successfully overcome, he can confidently resort to similar expedients, with such modifications as the circumstances may demand in his particular case, and pull through seeming impossibilities in the face of ignorant prejudice, certain to secure such acknowledgment from his employers as cannot fail to add to the strength and success of his management.

The Quinnemont Furnace (60×15 feet) had been in operation but two months, when it became necessary to draw the tuyeres out a distance of 18 inches, in order to give them a resting-place; the brickwork under them being completely cut away, so that after each cast they would sink from 6 to 8 inches, requiring a loss of from 1 to 1½ hours in raising and resetting. The tuyeres had been intentionally retained in their original position as long as practicable, in the hope that the cutting out would be retarded. This, however, did not prove to be the case, the process of destruction continuing as rapidly as ever.

The original thickness of the crucible wall (3 feet) was now reduced to 18 inches, and breaking out of iron was a frequent occurrence. As a still further protection, a wall of brick was carried up, encircling the hearth, with an annular space of 3 inches, which was filled in with fragments of fire-brick, upon which a constant stream of water was kept flowing at several points. This did not suffice to preserve the brick, for, at the expiration of a month, the walls had become so thin, that the tuyeres could not be maintained even in their new position without great loss of time in resetting. The quantity of fire-brick and clay used in the operation eventually mixed in with the iron, so that the old experience of fire-brick and iron not working well was repeated with monotonous regularity at each cast. The settling of the tuyeres finally culminated in one falling into the furnace, when it was decided to attempt to rebuild the hearth in sections, and at intervals. A section of the crucible measuring 7 feet on the outer circumference, 4 feet on the interior, and 4 feet high, was first removed. Commencing at the open tuyere arch, the air was excluded and stock held back with a heavy body of clay, tightly rammed with fire-brick, and driven back simultaneously, with the removal of the old work, and far enough to admit a 30-inch wall being set in with 15-inch blocks, 6 inches thick. The entire operation required 30 hours; quite a flow of cinder and some iron occurred as the last two courses of brick were raised, but was readily removed and did not prevent a clear foundation being secured, 6 inches below the level of the hearth bottom. Two weeks later, a section 5×3×4 feet was taken out on the opposite side, and rebuilt in the same manner, and, later still, repairs of a similar nature were carried out in the back arch. A rising of the brick was anticipated but did not take place, and beyond a slight bulging no trouble was experienced. The iron was kept very gray for several weeks, giving an excellent opportunity for the work to close up. The furnace was operated seven months longer without exhibiting any signs of weakness. Eventually the cutting out of the boshes necessitated its going out of blast, and on blowing out, the renewed sections were comparatively intact.

* A Paper read before the American Institute of Mining Engineers, at the Philadelphia Meeting, June, 1876.

ABSTRACTS OF LECTURES ON MINING.—No. IV.

By Prof. W. W. Smyth, M.A., F.R.S., Royal School of Mines, London.

(From the London "Mining Journal.")

THERE is, perhaps, no subject on which a greater amount of matter has been written than on mineral veins, but, as a rule, this is so scattered among various publications that it is difficult to meet with it. In some works, however a great deal has been collected, for example, in the "Geological Report on Cornwall and Devon," by Sir H. DE LA BECHE, and also in his latter work, the "Geological Observer." Then papers by Mr. HENWOOD, principally to be found in the "Transactions of the Royal Geological Society of Cornwall." Other works recommended for general or special study are—FOSTER'S "Sections of Strata" (for the North of England); FAIREY'S "Report on Derbyshire;" LONSDALE BRADLEY on "Veins of Swaledale" (for the Yorkshire veins); WALLACE'S "Lead Veins of Alston Moor;" J. A. PHILLIPS'S "Mining of Gold and Silver;" BROUGH SMYTH'S "Gold Mining in Victoria;" WHITNEY'S "Metallic Wealth of the United States;" J. D. HAGUE on "Mining Wealth of the 48th Parallel" (for Nevada); Prof. VON COTTA'S "Gang Studien," and Mineral Deposits; and MOISSENET'S "Etudes des Filons de Cornouailles."

A great deal of what I have to lay before you with regard to these veins may appear to be very simple, and obtainable very readily by a view of the mine; but the fact is that in the case of all, except the freshly broken rock, and especially since the use of gunpowder for blasting, the walls and other parts are so coated with a dark slimy film, that it is only by means of laboriously clearing a new face, and spending a considerable amount of time, that one who has not had very considerable experience can observe many of these things for himself. I mentioned in my last lecture that one of the principal features of lodes which we have to study is their extreme variability; we have hitherto examined, however, only the variation in breadth and character. I mentioned that in some we could see nothing which we might regard as a kind of arrangement, that there were others in which we could make out, either in whole or in part of the lode, that it runs into bands forming a ribboned lode; in others we meet with a brecciated structure, which reveals to us the movement which must have taken place in the lode itself, as well as in the country. In addition to this, one has also to notice whether there is, on the large scale, any relation between such changes within the walls and the richness and poorness of the lode. In large lodes we shall often find that they are occupied by what we may conceive to be masses of the adjoining ground, which have broken into the lode while it was an open fissure. Thus, in following a vein having a certain width, we find it at a particular point beginning to open out, and a mass of rock commencing, perhaps, with quite a wedge end, dividing the vein into two, much in the same way as the parting in a bed of coal or ironstone. Such a lode, in the language of the miners, "takes horse," the mass of rock between being called by them a "horse." It may be that the vein is workable on both sides, in other cases the richer portion is all on one side; if we work round the horse we must be careful to provide for the safety of the men beneath this suspended mass. Sometimes the name horse is given to the mass of the lode when it is valueless. It is usual to term the whole of the material contained in the walls of the lode the veinstuff, or lode stone, or matrix; the term gangue is often used in many books to signify the non-metalliferous material which is mixed with the metallic substance. The miners have a variety of names for these materials: the term spar is given by them to non-metallic material of light color, calc spar, etc.; quartz is termed hard spar; the term prian is used for light clayey substances resembling kaolin, and this, passing into a yellowish or darkish color, is termed flookan. In the North of England the term douk is applied to similar material in the lead mines, and it is there of great importance on account of the marked appearance of the lode in such ground.

In dealing with the deposits containing tin we shall find a much larger variety of associated minerals than in deposits of any other kinds of ore. It has been observed long since—by ELIE DE BEAUMONT first, I believe—that about 48 out of the 64 known elementary substances occur in tin mines—in combination, of course—thus giving rise to a great variety of minerals; and this is a point of some importance to the explorer, because, when he comes on certain of these which he knows to be associates of the ore of which he is in search, he is encouraged to proceed. Among the many minerals one is in the habit of meeting with under these circumstances may be mentioned calc spar, quartz, and fluor spar commonly; sometimes orthoclase feldspar, pale or reddish; mica very frequently, topaz, apatite, beryl, schorl abundantly, both iron and copper pyrites, mispickel, wolfram notably, and molybdenite. In some cases you have a far larger number of these present than in others; thus, while, on the one hand, in the lead veins of a district like Flintshire you find nothing but galena, calc spar, and a yellow clay, on the other hand, in such districts as those of Saxony, Hartz, Cornwall, etc., you meet with a wonderful variety of different mineral species. It is a very notable matter that, as you follow a lode along its course of direction, it will be found to vary, not only in magnitude but in general character and richness of deposits. Masses of ore are called bunches if short, if of great length they are courses, if very irregular all round they are called squats, or pockets, the corresponding Spanish term being bonanza. If you have a tolerably regular vein it would be said to be a shoot of ore dipping in such a direction, if extended more in height than length it would be called a pipe, or shoot (chute in California, or chimney). In working these irregular deposits I may here point out to you a striking difference between good and bad mining; in the latter case such a state of things as you may find in barbarous countries, and, I am sorry to say sometimes in our own country also, shafts are opened out and levels are driven, but you will find the levels are driven only a few feet beyond the place of working; the deposit in that particular spot is worked out, and the workings often stop here. You will then be told that they have done all they could, they have worked out the ore, and left off with poor rock all around them, and had been at considerable expense to drive into the rock about with no success. On the other hand, it may be asserted that this is a thoroughly unsatisfactory mode of treating the problem; that unless you have great reasons given you by the example of other mines in the neighborhood, there are no grounds for imagining that the lode comes to a total stop in that way. A prudent miner will endeavor while taking away the ore from the points already discovered to drive out his feelers, in order to discover others in different parts, and not wait until the first are exhausted. In many of our mines, where the working has to be carried on in a spirited manner, the levels have been driven through such dead work between the deposits for distances of from 20 to 120 fathoms. And in driving through such dead work, constant watch must be kept for the mine beginning to be "quick," as indicated by specks of ore, sometimes by a change of ground, sometimes by the appearance of minerals which are known to associate with the ore. Of course, it is an interesting inquiry as to how far we may have to drive before meeting with the ore again, how far the shoots occupy a definite position.

In some parts, as in Flintshire, Denbighshire, Durham, and Cumberland, we shall find that the deposits depend on a change in the nature of the rock, in other cases this is far less assured. Miners are always anxious to try to explain the depositions in some way or other as a guide for future operations, and they often try to see some parallelism between the joints, or the cleavage, or stratification, but we must be on our guard not to conclude too hastily, or to force ourselves to believe in some particular theory merely for the sake of coming to some conclusion. There are some features to be observed where a lode passes across the junction of two rocks, where, for instance, we have it in the rocks commonly met with in Cornwall and Devon—granite below and slate rock above. We cannot study this better than in the curious Levant Mine, in the parish of St. Just, opened under the Atlantic Ocean. You will observe [referring to a section shown] that the ore has been removed in irregular masses, those being the richer portions and the surrounding parts being not sufficiently rich for working, according to the price of ore at that particular time; but when, for a reason like that, any portion is left, it is necessary that the manager should keep the circumstancse in mind, in order that the men may return to it again if a change in the market render it profitable. The ore, as you see, occurs in both slate and granite, and especially near the junction of the two, but you may notice that after the levels have been carried into the granite 30 or 40 fathoms they have been abandoned as unproductive, and the workings have been extended chiefly in the direction of the slate: it is in this manner that the workings have been driven into the sea. I might mention that this mine is notable for the depth—300 fathoms—to which the workings have been extended. Although the direction of the lodes is subject to considerable variation, as is readily seen when carefully traced and mapped, yet there is a remarkable degree of parallelism of the lodes in different districts to one another, and this is especially the case if we confine our attention to lodes bearing the same class of mineral. In Cornwall they run, with a few exceptions, E.N.E. and W.S.W., bearing copper and tin, so that we shall have a definite direction in which to follow out our search: other veins, deviating from the general direction to 20° or 30°, are called caunter lodes. In the North of England it is usual for the lodes to run E. and W., and the term "right running lodes" is then applied to them. In Saxony there is a similar set of E. and W. lodes, together with others having different directions. Generally speaking, the caunter lodes have different contents from the main or champion lodes. There are also other veins running at right angles to the general direction of the district; they are then called cross courses.

The next point to notice is that the lodes do not run very regular for long distances, although occasionally they may be traced for a long distance with walls as smooth as those of this building. It is held by careful miners that

a great deal depends upon the variations in the direction of the vein, and that a deviation of a few degrees may affect materially the productiveness of the lodes in these portions. You may see this exemplified in the plan of the Dolcoath Mine. We shall, however, examine the question more carefully hereafter. There are some few cases where the lode turns round through a great angle, but these are very exceptional; at Berehaven, in the extreme west of Ireland, is a very remarkable case, the lode there found being something like a right angle, and is, in fact, compared by the miners to the handle of a winch. Again, in some districts the lodes have a tendency to be small, and to become reduced to small strings; in these districts, as a rule, too, they are very irregular, so that your discovery of riches in one place cannot be depended upon as likely to lead you to anything of the same sort a little distance off. The veins of our western districts are charged with being of this character, but among the St. Just veins are apt to run small. These have been opened from 10 to 12 ft in the Levant Mine, and from 12 to 18 ft. in the Botallack Mine. In the eastern parts of Cornwall and Devon the veins may be followed for two or three miles, and may be seen at their ends to ramify and become lost in the country. If we cross the channel in to South Wales we shall find that much the same holds good; on the narrow strip of mountain limestone in that district the lodes are not usually traceable for more than from ½ to 2 miles, but the cross-courses may be traced (in the direction of the longest extension of the formation) for 12 or 14 miles. Of the North of England, again, much the same may be said; a vein near Richmond, in Yorkshire, is said to extend for 30 miles, but I doubt whether this is quite correct. A vein may cease as an individual vein, and some distance further on another vein having the same course (and perhaps due to the same sort of condition) may be found and be mistaken for the first. As a general rule, those largely worked in foreign districts have not been traceable for any great distances; those of Freiberg, for instance, being 6 to 8 miles long in some cases, 3 to 4 in others; and powerful lodes of Schemnitz and other districts in Hungary are traceable, many of them from 2 to, at the outside, 4½ miles. In California it was stated that some were traceable for 200 to 300 miles, but this is not upheld by careful examination; there is one notable one, however—*vena madre*—which exists as a single fissure for 30 miles. Sometimes, in working these lodes you come to an end suddenly, without sign of any dislocation, and often on digging down you come to the commencement of another lode under the end of the former, and continued in much the same direction. We can conceive that both of them were due to one cause, that it is merely a continuance of the tension of the ground which caused another fissure in the same line. A vein which can be traced for a considerable distance is called a "master lode," or in the Spanish *filon maestro*. Some lodes are repeated at different levels, and certainly it is usually the case that the character of the ground is propagated downward, and in all vein mining the men look naturally to the shoot being extended downward rather than horizontally. And in extending the works downward, if the ore at the lower levels occupies a broader basis than in the higher, we may look to its being continued downward further, and the reverse if it grows narrow; the displacement, too, of the main mass of the ore to one side or the other will determine the extension of the works in that direction.

NEWBURYPORT, MASS., SILVER LEAD MINES.

Special Correspondence of the Engineering and Mining Journal.

TO THE EDITOR: SIR—This mining district is now rather "under a cloud" from want of capital, also partly from some queer freaks of human nature, regarding development of mining properties.

The main shaft of the Minimac Company is now down about 230 feet, vertical. The ore body dips southerly, and has lately been struck at the 150-feet level, by the crosscut. This mine now has a set of concentrating machinery in operation, consisting of a combination of revolving tables and saddle back frames, which seem to give good satisfaction thus far. The ore still consists of a fine grained galena, mixed with some gray copper, etc.

The Georges Mine Company, having prospected the outcrop of their vein, are preparing to sink a shaft for general working purposes. Their show has always been highly encouraging. Much of the ore has been gray copper of high grade.

Operations at the Four Rock Mine are suspended, owing to some unknown cause. The ore here is excellent and of good quantity, while the developments thus far made prove it to be second to none.

At the Cedar Mine, a crosscut is being pushed from the 50-feet level of the main prospecting shaft, toward the spathic band, which outcrops so favorably on the surface. The mixture of galena, etc., in this band, shows a close resemblance to the "Silver Islet" (Lake Superior) ore, except that no native silver has been detected.

Considerable drifting is being done at the Rowell Mine, in Amesbury, but no special developments are as yet reported. Great excitement has been caused, of late, by the discovery of nickel ores in several places on the borders of the district. In some of these ores (nickeliferous pyrrhotine) the nickel runs, by assay, up to 8 per cent., with 3 per cent. cobalt.

An old mine in Carlisle, Mass., has just been reopened by one of our mining men, and proves to be a rich vein of copper glance, associated on the surface with black oxide, etc. This district will yet compare favorably with her elders, but needs capital. In fact it is my opinion, that if by some magic art it could be taken two thousand miles further away from New York and Boston, the capitalists of both places would have given it far more attention.

Yours, etc., 922.

July 10, 1876.

NORTH SHORE OF LAKE SUPERIOR MINING NOTES.

Special Correspondence of the Engineering and Mining Journal.

WITH the exception of Silver Islet, there is no claim on this shore that can aspire to the name of mine, though Duncan is making rapid strides in that direction by the erection of a ten-stamp mill, and by having opened a large extent of ground ready for stoping, that promises well. All other claims are in the prospecting stage, with more or less underground openings, but none either working or shipping ore.

So far this season, there seems to be considerable activity in opening new claims. Among those at work are the *Canada First, Cloud Bay Mine, Native 7, Angus Island, Pic, Round Island*, by the Silver Islet Company, *Artikameg Company* at White-fish River and Dog-fish Lake. It is expected some others will continue explorations. Many of the older mines are idle on account of difficulties in finance, the result of being overstocked and unassessable.

There is very little doubt but that Thunder Bay Mine, "3 A.," and others might be developed into paying properties, if sufficient capital were at hand to give them a thorough exploration. So little money was put in at the beginning, that with the first pinch of the vein, or in some cases unfortunate management, all confidence was lost, when the workmen themselves had all faith, and no more money could be raised, the stock reserved for working capital having no value.

If these mines are valueless, then the whole district might as well be abandoned, the silver being confined to the surface only. The veins on which these mines are, have proved to be continuous, so far as the deepest explorations have gone, but barren in silver, though zinc-blende, galena, and pyrites are found carrying small amounts of silver. It is a theory about here that the rich silver is in floors which I believe was the experience at Silver Islet to some extent.

The news from *Silver Islet* seems a little blue just now, but needlessly so, as they have not yet reached 1,000 feet in depth, with their deepest borings, and have already been partly rewarded by striking small bodies of rich ore, showing that better results may be expected at a reasonable depth. They are conducting the borings for explorations with the Diamond Drill in a very systematic manner, with strong indications of ultimate success in some directions. If reports are true, they have made some very curious developments, striking large quantities of inflammable gas and water that deposits salt. This latter may account for the chloride of silver that is found in small quantities with the native silver. This company is carrying on explorations on other parts of their property. They produced about 200 tons of rich ore and concentrations during Winter months $500 to $1,500 per ton in value.

The Duncan Mine (Shuniah) have been developing their vein to the west of former pits, and so far have proved this ground to be as rich, if not richer, than that opened last Winter. The winze west of No. 2 shaft is now down 28 feet, following the extreme south leader a few inches at surface. It has increased in size and carries native silver in larger quantities as depth has been gained. The main silver bearing leaders are to the north of this winze, and as soon as it is down to the level, it is expected the stopes will develop some very rich ore. The surface is being stripped between the shaft and winze, and so far shows a continuous belt of good stamp work, although 100 lb. of A 1 was taken out in one day. The last lot of A 1 shipped assayed 1,616 ounces per ton. The machinery and lumber is on the ground for a ten-stamp mill, and work progresses rapidly. This mill will be similar to that at Silver Islet, employing four of FRUE's vanning machines to effect the concentration. It is to be hoped the mill will be in operation by the 1st of September, so as to give some results before the close of navigation. There is much interest in this mill, for if it proves successful other mines will be encouraged to work veins that do not contain $1,000 ore. The deep shaft of Duncan is down 270 feet, still in the green slates. No improvement is looked for until these slates are passed.

Canada First and *Cloud Bay* are both cross-cutting through the slates to tap large spar veins in depth, expecting the vein will prove silver bearing when cut.

The *Angus Island* exploration is a case of clear grit. The shaft is to be sunk on a little rock not worthy the name of island to sufficient depth to make cross-cutting safe under the lake, at the bottom of which can be seen a vein in the same belt of diorite on which is Silver Islet. Some very pretty rock-carrying native silver and zinc-blende in spar and slate has been shown as coming from the neighborhood of Pigeon River, and it is reported parties are out locating claims in this direction. If the specimens are genuine and not borrowed from the Duncan, which they resemble closely, this new discovery promises to be an important one. I have reason to believe the discovery is a *bona fide* one.

The *Artikameg* have sent down some specimens carrying galena and zinc-blende of which I have not learned the assay.

Captains HILL and DAVIS from Isle Royal visited the Bay recently, reporting matters on the island as satisfactory.

The *Minong Mine* is about to build a stamp mill; good stamp work as well as mass copper having been developed. The loss of the St. Clair makes a deep impression here, several well known mining men from the South Shore having been lost.

"EZUEST."

THE COAL MINES OF WYOMING.—The coal mines in this vicinity are the most extensive in the West. At Almy, two and a half miles from Evanston, are the Rocky Mountain Coal and Iron Company's mines, three of which are being worked. The vein is twenty-six feet in thickness and several miles in length, extending into the mountain to a great depth. This company averages about eighteen cars of coal per day during the year, most of which is shipped to the Central Pacific Railroad. The Union Pacific Railroad Company's mines, W. W. SERAT, lessee, are also nearly as extensive, an average of from twelve to fifteen cars per day being shipped away, partly to the Union Pacific Railroad and partly to Salt Lake City. From 175 to 250 men are constantly employed at these mines.

There is also the Unita mine, owned by S. H. WINSOR, which is turning out from fifteen to twenty tons per day, which supplies Evanston, Wyoming, with fuel.

About forty miles due north from Evanston is what is known as the twin Creek coal mine, owned by the Wyoming coal and coking company, with a capital stock of $2,500,000. The peculiarity of this coal is that it is easily converted into coke, thousands of tons of which are used in Utah and Nevada for smelting purposes. This is the only coal that has been discovered west of Pennsylvania that can be made to coke successively. A number of coke ovens are now being constructed and by the first of May we expect at least one hundred teams will be required to convey the coke to the railroad.

Only eighteen miles from this mine, and twenty miles from Carter Station, is the Mammoth Sandstone Mountain Coal Mine, which is the largest coal mine that we have ever any knowledge of ever having been discovered. It is about four miles in length, and consists of sixteen veins, one lying above the other, a thin layer of sandstone intervening. The bottom vein is the smallest, being about five feet in thickness, while the next one above is over seventy-five in thickness, with one a few feet above of sixty feet, another forty, and so on, making about four hundred feet of solid coal. These veins slope at an angle of about twenty-two degrees, and are very easy of excess. The coal is very bright, and free from slate or dirt.

SILVER DISCOVERIES ON LAKE SUPERIOR.—Two letters received in this city during the week represent that highly important silver and gold discoveries have been made in the vicinity of Arthur's Landing, on the north shore of Lake Superior, about two hundred miles noreast of Duluth. These reports are trustworthy, and intimate that a few days ago, near what is known as the Thunder Bay mine (which has been yielding from $2,000 to $3,000 to the ton of rock), a miner dropped down upon an outcropping of crumbled quartz, all bristling with native silver. At last accounts they were gathering the rock in carts and packing it for the stamp mill. It was thought it would yield from $3,500 to $5,000 per ton. Another discovery has likewise been made at a new opening called the "17 K" mine, recently bought up by some Boston men, who have a large force of workmen employed on their premises. In consequence of these silver discoveries, and also of some rich gold quartz, there is a large amount of mining excitement; indeed, so great is the interest aroused, that the Canadian Pacific Railway (now building from Thunder Bay northward) is almost forgotten, nobody apparently caring whether it goes through or not.—St. Paul (Minn.) *Pioneer Press*.

HYDRAULIC MACHINERY AT THE PHILADELPHIA EXHIBITION.—NO. 3.

Special Correspondence of the Engineering and Mining Journal.

CRANE PUMPS.

THIS company, whose works are located in Chicago, exhibit several patterns of pumps, most of which are made for fire or factory purposes. The auxiliary valve pump which they exhibit works very smoothly when running at high rates of speed. The auxiliary valve is worked by means of an attached stem on which slides a tappet rod from the main piston rod. The auxiliary valve is so connected with the main valve that in case the steam does not quickly start in the piston of the auxiliary cylinder above danger of breaking the steam cylinder beds is avoided through the opening of the main slide valve by the direct action of the auxiliary valve upon it.

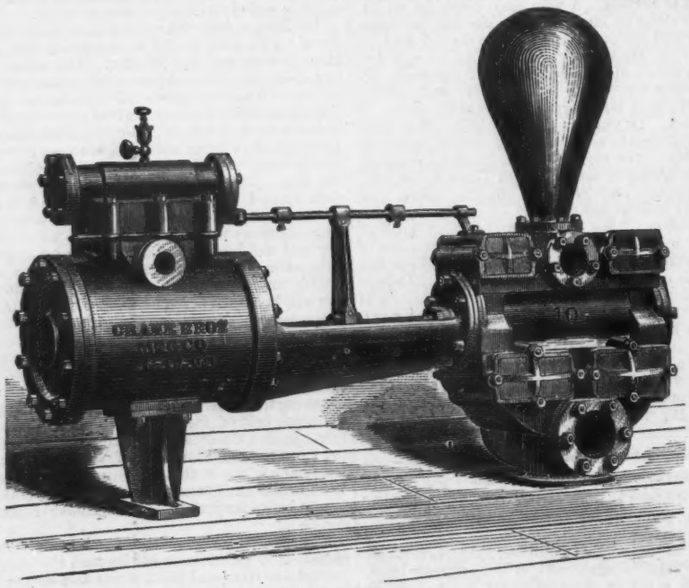
Another pattern of pump made by CRANE BROTHERS is what they call the Duplex Fire Engine Pump. It is an ordinary two cylindered engine, whose piston rods are prolonged so as to work two pump barrels placed back of the steam cylinders. Behind the water cylinders is a fly-wheel and shaft which is driven by connecting rods from the steam piston rods. This pump, although not possessing any novel features of construction, has been working very well since the opening of the Exhibition.

NATIONAL STEAM PUMP.

This is a direct acting pump, with auxiliary cylinder. The piston in the auxiliary cylinder is moved directly by a stem loosely attached to it, which is struck by a tappet rod from the main piston rod. The motion of the auxiliary piston is cushioned by means of spiral springs, which are used in place of confined or live steam, as is common. The water valves, which are of the poppet variety, are placed at the ends of the cylinders. The suction and delivery of the water takes place through long ports cast on the cylinders.

PUMPS WITH INTERNAL VALVE GEAR.

To protect as completely as possible all working parts, some makers of direct acting pumps have constructed the steam valve apparatus so that it is entirely concealed from sight. The opening of the main steam valve, is as usual, accomplished through the agency of an auxiliary cylinder. Motion to the plungers contained in these auxiliary cylinders is produced either through the admission of live or of exhaust steam when raised to a considerable pressure by being used for cushioning at the termination of the stroke of the main piston. One of the most widely known pumps having this kind of valve gear is that made by CAMERON of New York, but for some reason he makes no display at the Exhibition.



CRANE PUMP.

L. D. GREEN PUMP.

Several of these pumps, which are made by BAGLEY & SEWALL, of Watertown, N. Y., are in operation at the Pump Annex. The case of these pumps consists of a short, horizontal cylinder, having a concentric ring, which divides the interior into two spaces, the outer being an annular one, while the inner is merely a small cylinder through which revolves the driving shaft. To this driving shaft is keyed a disk, to which is fastened an eccentric ring, which revolves in the annular space between the case and its internal ring, in such a manner that it always bears on them both at the same time. The internal fixed ring and the casing are both cut away on the same horizontal line, and across this cut work two small abutments, which effectually prevent the water, which is taken in from below them, to be carried round and round when the movable disk revolves. These two sliding abutments press against tumblers in which the eccentric disk slides, and which, by the pressure of the water, insure a tight joint. The suction pipe enters the annular space right below these sliding abutments and the discharge pipe is vertically above them. The water is drawn into the spaces, which are both inside and outside the revolving disk, and by it are forced out through the discharge pipe. The space exterior to the disk discharges the same amount as the interior, the space in the latter being made deep enough to have exactly the same area. One end of the driving-shaft has a bearing inside the pump case, while the other is closed by the pressure of the column of water raised against a collar on the revolving disk, which works against a seat in which are cut small grooves communicating with the suction pipe, so that what water escapes from the body of the pump is drawn right back again. The source of greatest loss of power in running these pumps must result from the considerable friction which takes place between the revolving ring and the tumblers which inclose it, and also that which takes place where the sliding abutments work against their seats, and which have to bear the pressure of the whole column of water raised.

PICKERING PUMP.

This pump is made in Stockton, England. Its general construction is like that of the Cameron special pump, the only noticeable difference being a gland which completely covers the piston rod between the steam and water cylinders. In this pump, therefore, no moving parts are visible.

FOULDS PUMP.

The novelty in this pump consists in conveying the exhaust steam from the steam cylinder to the suction pipe of the water cylinder, where it is drawn in with the entering water and condensed. This arrangement is fitted up with two cocks, so that the steam can be condensed in the manner just described, or else exhausted in the ordinary manner into the open air. When stopping a pump having this construction, care must be exercised in shutting off the exhaust steam from the suction pipe, for if this is not done the water will quickly drain out of the suction pipe into the reservoir from which it is lifted. When in good working condition, a vacuum of about 20 inches can be maintained by this method of condensation. The heat also which is contained in the steam is imparted to the water, an advantageous circumstance when the pump is used as a boiler feeder. Where pumps are worked in underground mines, shafts or slopes, the exhaust steam is frequently allowed to escape directly into the air, an arrangement which is objectionable in several respects. It causes much personal discomfort to those who have to be near them, and the effect of the moist steam on soft roof rocks and timbering is very injurious. The Foulds arrangement does away with this difficulty in a very simple manner. When the steam from the boilers contain air, this condensing apparatus must work imperfectly, as the air not being condensable, and collecting in the suction pipes, interferes with the regular action of the pumps.

VALLEY MACHINE COMPANY PUMPS.

These are made almost exclusively for boiler feeding, and are vertical-acting. They are fly-wheel pumps, the steam cylinder setting above the water cylinder, with a yoke on the piston rod, in which works a horizontal crank shaft. The steam valve is worked by a simple eccentric from this shaft. The bed plate supports at one end the two pump cylinders, and at the other the air chambers, on whose top rests one end of the fly-wheel shaft. The suction and delivery valves are inclosed in a box cast on the bed plate between the water cylinder and the air chamber. The water is forced by means of a double acting plunger. Its action is as follows: When the plunger descends, the water which is forced out divides, one-half going through the delivery valve, while the other half is conveyed to the upper side of the plunger, whose diameter is reduced so as to have but one-half the sectional area of the bottom, and when the plunger ascends, the remaining half of the water is forced out into the delivery pipe. This construction is adopted in order to insure a regular motion to the delivery of the water.

ROTARY PUMPS.

Under this heading are included all those pumps in which water is lifted and forced to a height through the agency of one or more revolving pistons fitted with cams, rings, or interlocking arms. They are to be distinguished in general from centrifugal pumps by the fact that they force the liquid which passes through them by mechanical pressure of moving parts, while the centrifugal pumps, raise liquids by means of the momentum which is given to them in passing through the pump. One of the most valuable features in rotary pumps consists in the constant motion in one direction of the fluids which they raise. In the reciprocating pumps there is at every half stroke a loss of power from the arrested motion of the moving parts and the water, while in a well-constructed rotary pump the motion of the water is continuous. This continuous motion of the liquids in one direction does away also with the necessity for suction and delivery valves, which are indispensable in all reciprocating pumps.

Rotary pumps have, however, several defects which prevent them from surpassing all other forms in the amount of useful work done. In the first place, their frictional moving surfaces are large, so that when bearings are tight much of the power is lost from this cause, and when loose the back leakage of water becomes considerable. When revolving disks are used the bearing surfaces perpendicular to the axis of revolution are exposed to unequal wear, those portions nearest the circumferences traveling through much greater distances than those near the axes.

The mechanical difficulties in taking up wear, either on these surfaces or where cams lock together, are very considerable, and in most cases involve a duplication of the parts. Where it is necessary to raise water to considerable heights, these pumps do not generally succeed well, both from the inherent weakness of some of the parts and the loss of water by back leakage. For moderate lifts, and where a small pump, in proportion to the amount of water raised is desirable, the rotary pump is often quite advantageous.

THE CONDÉ PUMP.

This pump, which is made in Philadelphia, uses the exhaust steam when under pressure at the end of the stroke to effect the moving of the plunger in the auxiliary cylinder. This plunger, whose under surface in the center forms the bonnet to the steam valve, works in the auxiliary cylinder, which is cast in one piece and bolted down to the valve seat which is cast on the top of the main cylinder. In case the valve sticks, and does not work automatically, a hand lever, which is placed on the auxiliary cylinder, can be used until the proper action is restored. The steam pipe, instead of being jointed to the valve chest, as is usual, is connected to the main cylinder, the steam passing up through a port to the valve chest. The steam valve and auxiliary cylinder can with this arrangement be removed for repairs or inspection without deranging the steam pipe. The water valves are all placed in a square box, a discharge valve being over each suction valve. The valves are of the poppet variety, their seats are made of composition, which can be easily removed and replaced when worn. When worked with quick stroke the valves are held down to their seats by spiral springs.

THE CALIFORNIA PUMP.

This pump is made by W. D. HOOKER, and in the arrangement of its valve gear does not differ essentially from the one last described.

THE SOUTH-EAST MISSOURI LEAD DISTRICT.*

By G. C. Broadhead, Pleasant Hill, Mo.

THE lead district of South-east Missouri covers an area of over 3,000 square miles, including Maries County on the west, Jefferson on the east, Franklin on the north, and part of Madison on the south, or parts of ten counties.

A general section of the rocks of the south-east part of this region would be about as follows, numbering from the top :

1.	Sandstone (the 2d of Missouri geologists)	20 feet
2.	Chert beds—beds of passage below	125 "
3.	Magnesian limestone, chert and quartzite	100 to 300 "
4.	Lower magnesian limestone	100 to 150 "
5.	Gritstone and lingula beds	50 "
6.	Ozark marble beds	5 to 20 "
7.	Sandstone and conglomerate	5 to 90 "
8.	Porphyry } Archæan.	
9.	Granite }	

The thickness is approximate, for it is not possible to obtain the correct thickness of the various beds. No. 1 may be seen as detached outliers or loose masses of a hard sandstone or quartzite, and is found on the hill-tops in the southern part of Madison County, in like topographical position in Reynolds County and the western part of Washington County.

No. 2 consists of alternations of chert, clay, and quartzite. It is the formation which contains most of the limonite deposits of Central and Southern Missouri. In Reynolds County shafts have penetrated it 75 feet. Outcrops there and in Madison would indicate it to be at least 125 feet thick. Fossils obtained in various places prove it clearly to be of the age of the calciferous sandrock of the New York system, and Nos. 1 and 2 may also be referred to the age of the 2d sandstone of Missouri.

No. 3 consists chiefly of thick beds of ash, flesh colored and drab magnesian limestone, both coarse and fine grained. These beds, where they occur, in Washington, Jefferson, and the southern part of Madison Counties, contain a good deal of quartz in drusy cavities. In Washington County the limestones are beautifully ramified by a system of connected drusy cavities generally lined with minute quartz crystals arranged in botryoidal and mammillary forms and called "mineral blossom" by the miners. This is the lead-bearing rock of Washington County, but in the southern part of Madison it does not appear to be galeniferous. It is also undoubtedly the equivalent of the lead-bearing rock of Central Missouri, and is known in Missouri geology as the 3d magnesian limestone. In Washington County it is from 200 to 300 feet or more thick, but in Madison probably not over 100. No fossils have been obtained from it in these counties. I would here remark that the line of division between Nos. 3 and 4 is not well defined. It may yet be proved that they belong to the same group.

No. 4 consists of either dark ash or flesh-colored dolomitic limestone generally occurring in thick beds. On Mine La Motte tract this limestone, with the underlying gritstone beds, is 80 feet thick. At St. Jo Mine, St. Francois County, it has been proved to be not less than 200 feet thick. At the lead mines it soon becomes brown upon exposure.

At Mine La Motte a thin band of blue shale is found which abounds in a *Lingula* (*Lingulella*) *Lamborni*, which is regarded as a Potsdam fossil by Palæontologists. Near Fredericktown the lower limestone beds contain this fossil, together with *Scolithus*, *Orthoceras*, and a *Pleurotomaria*. This is the lead-bearing rock of Mine La Motte, Fox Mines, Avon Mines and St. Jo.

No. 5 is a close-grained, even-bedded silicious dolomite, sometimes having drusy cavities lined with dolomite. The various beds seem to be chiefly formed of rounded quartz grains disseminated in a compact dolomitic paste. Its greatest thickness amounts to 23 feet, but it is even sometimes wanting.

No. 6, the marble beds, are not always present ; for in the northern part of Madison County No. 5 rests directly on No. 7. These beds consist generally of fine grained, even-bedded magnesian limestone of gray, red, flesh-colored, buff or mottled white, with red, buff, or drab, the colors sometimes quite beautiful. It admits of a high polish and is quite handsome.

The lowest unaltered sedimentary rock of South-east Missouri is a sandstone generally course grained, although we do find it of fine grain. It also occurs as a conglomerate, formed chiefly of porphyritic pebbles. Its chief outcrop is in the southern part of St. Francois and northern part of Madison Counties, especially on the Mine La Motte tract where we find it directly reposing unaltered on the porphyry, and farther westward on granite. Its greatest thickness is 80 to 90 feet, but is often much thinner. The occurrence of any ore in it is very rare, and only at one place have I heard of a little galena being found.

With regard to the age of these rocks we would call No. 7 (the sandstone) Potsdam. If *Lingula* (*Lingulella*) *Lamborni* is restricted to the Potsdam group, and the *Scolithus*, also occurring in the same bed with the *Lingula*, we should, without hesitation, regard the rocks as Potsdam, but if these fossils are also found in the calciferous group we should prefer to assign all our rocks above the lower sandstone to No. 1, inclusive, as calciferous, for there has thus far been found no well-marked line of division between Nos. 3 and 4, and the late Dr. SHUMARD stated in his reports that No. 3 (the 3d magnesian limestone) undoubtedly contained calciferous fossils.

The oldest rocks of South-east Missouri are the porphyries and granites. We know that the porphyries are older than the above-named rocks, because we have found the lowest sandstone resting unaltered on them, and also upon the granite. We also have found the lowest magnesian limestones resting on this sandstone, and also unaltered upon the porphyry. We therefore have a correct succession of rocks. Our data, thus far, is not sufficient to establish the age of the granites, or whether they are older than the porphyries, but we incline to the belief that they are. Our porphyries, though, are exactly similar to those of Massachusetts and New Brunswick, which are considered Huronian. We, therefore, feel correct in calling ours Huronian. Our granites may be Laurentian.

ORES OF THE ABOVE.

The ores of Nos. 4 and 5 include those of lead, copper, nickel, and cobalt. The oldest worked mines are those of Mine La Motte, where lead was mined soon after the year 1720. At intervals, these mines have been much worked during the present century. The ore occurs disseminated in horizontal limestone beds, throughout an average vertical thickness of 7½ feet. The cap rock and bed rock are of like composition, but contain very little ore. In one portion of the mines, copper ore (chalcopyrite) is quite abundant, and is intimately associated with the galena. At another place we find nickel and cobalt quite abundant. This mine having been formerly particularly described, we pass on to others, simply mentioning that at the Avon and Fox Mines the ore occurs very similarly, and that the formation is of the same geological age. At the Fox Mines much of the galena is found in drusy cavities, associated with pyrites, calcite, and dolomite. But it is of the St. Jo Mines that we wish more particularly to speak. As we have stated before, the rocks are similar to those of Mine La Motte, but the ores are only lead and copper. The rock here is a dense ash-blue magnesian limestone, reposing in nearly horizontal strata. The St. Jo Company at present have two working shafts of 80 and 100 feet depth, the ore-bearing rocks being the lower 25 feet, arranged in tolerably uniform layers of two to four feet in thickness. No vertical veins were observed, but the mineral will sometimes follow vertical cracks. At one place, solid layers of galena, of about three inches in thickness, are intercalated with the limestone beds every few feet; but the ore is generally disseminated in the limestone. In the copper beds, bands of chalcopyrite are of frequent occurrence. A vertical section at one place shows :

1. Several feet of magnesian limestone, occurring in even beds, and containing a small percentage of disseminated galena.
2. 6 feet of magnesian limestone—no galena observed.
3. 3 inches—sheet of galena.
4. 2½ feet of limestone.
5. 3 feet of limestone with a good percentage of galena.
6. 4 feet—nearly all galena—with a very little limestone.

The Desloge Shaft.—Just adjoining the St. Jo Lead Company's land, and only a few hundred feet north-east, the Missouri Lead Mining and Smelting Company have sunk a shaft 120 feet, and bored 84 feet further, passing through rich galeniferous limestone. A section recorded by the company reports passing through limestone with disseminated galena as follows:

Galena at	33⅓		feet	from surface.
" "	46		"	" "
" "	78		"	" "
" very rich at	78	to 80	"	" "
" at	81		"	" "
" a little from	83	to 97	"	" "
" richly disseminated	103	to 104	"	" "
" sparsely disseminated	104	to 114	"	" "
" a good percentage	114	to 116	"	" "
" a very little to	117		"	" "
" a good percentage, from	117	to 127	"	" "
" disseminated, from	120	to 138	"	" "
" very rich, from	138	to 140	"	" "
" disseminated, from	140·6	to 140·9	"	" "
" fair disseminated, from	140·9	to 141·3	"	" "
" very rich percentage, from	141·3	to 142	"	" "
" disseminated, from	142	to 151·6	"	" "
" very rich, from	151·6	to 152·3	"	" "
" good, disseminated from	152·3	to 154	"	" "
" lean, from	154	to 155·6	"	" "
" rich, disseminated from	155·6	to 156·6	"	" "
" lean, disseminated from	156·6	to 157	"	" "
" very rich, disseminated from	157	to 158	"	" "
" good, disseminated from	158	to 159	"	" "
" lean, " "	159	to 161·3	"	" "
" rich, " "	161·3	to 164	"	" "
" a little ore, from	164·5	to 165	"	" "
" very rich from	165	to 167	"	" "
" mineral, from	167	to 175	"	" "
" lean, from	179	to 182	"	" "
" disseminated, from	184	to 194	"	" "
" very rich, from	194	to 197	"	" "
" some mineral, from	197	to 204	"	" "

The limestones here lie about horizontal, and it is impossible at present to estimate the probable extent of the galena, but it is undoubtedly very great.

The galena at St. Jo, as at other mines in the lower limestone, is coarsely granular, and cubes are of rare occurrence, but in small drusy cavities very nice crystals of a secondary form are often found. Iron pyrites, dolomite and calcite abound at the Fox Mines. Calcite and dolomite are of general occurrence; barytes, if at all seen, is very rare.

With regard to the origin of the galena in these mines, we would give as our theory that the limestones were first formed in deep seas. That after and during a long period of subsequent time, the galena, in a state of solution, replaced a portion of the limestone beds which had previously been softened by acids. We would not hazard the opinion that the process of replacement was recent, but rather believe it to have taken place in some remote period of time, and probably before the deposition of the galena among the more recent formations of South-east Missouri; also, that its formation must have continued through a long period of time, for the galena did not replace the limestone in the different beds at the same time, nor is it certain that the process was in progress in different beds at the same time.

ORES IN NO. 3, OR THE 3D MAGNESIAN LIMESTONE.

Some of the mines of St. Francois County, for instance the Vallé Mines, and all of those of Washington and Crawford Counties, occur in these rocks.

The ore occurs either—

1st. In caves or openings.

2d. In leads or lodes.

CAVE OPENINGS.

Although there may be a slight difference in the form or shape of the deposits, still I believe that all the galena ores of this formation, excepting the "*leads*," may come under this head, nor am I certain that the vertical leads should be separated.

The limestones are often bisected by vertical cracks or fissures, crossed by others. These are sometimes narrow, but are often widened out, probably caused by breaking off and disintegration of masses of limestone. The ore and its associated minerals are limited by "runs" and "openings." The "run" is a widening of the opening, and must not be confounded with the runs of South-west Missouri. It is limited above and below with solid limestone, which cuts it off from other runs below, sometimes only separated by a few feet, but at other times much more. These runs may therefore be considered as occupying a part of the same crevice, and shut off from each other by closing up of the walls.

At Prairie Diggings, on "Old Mines" tract we entered a run of 7 feet wide at 55 feet depth, extending in a nearly northern direction as far as explored for several hundred feet. Other short runs or cave openings meet the main run, but generally terminating within a few feet. Others, extending further, develop into similar openings to the main run.

These "runs" or "openings" are filled with masses of decomposed mag-

* A Paper read before the American Institute of Mining Engineers at the Philadelphia Meeting, June, 1876.

nesian limestone, barytes, iron pyrites, galena, and calcite, sometimes confusedly arranged, but often in regular broken horizontal layers, the galena generally preserving a nearly horizontal position in its arrangement, and when disseminated, it is found occupying nearly the same horizontal line. The galena is sometimes inclosed by bands of pyrites, and at other times associated with a gangue of barytes, the latter apparently of more recent age.

A vertical section in the main run at one place shows—

1. Cap rock of magnesian limestone.
2. 1 inch of barytes and galena.
3. 10 inches decomposing magnesian limestone.
4. Streak of iron pyrites.
5. 4 inches of barytes and galena.
6. Streak of iron pyrites.
7. 2-feet mass of barytes, boulders of softened limestone, galena, and streaks of iron pyrites.
8. Bed-rock of magnesian limestone.

At "New Diggings," near Potosi, the galena occurs in a similar association with barytes and pyrites.

The ore at Mineral Point occurs very similar and in irregular-shaped openings. A vertical section in a shaft displays—

1. Clay and chert.
2. Limestone.
3. Red clay, barytes, and a little galena.
4. 10 inches barytes, in nearly horizontal bands with galena.
5. 5 inches magnesian limestone.
6. Thin seam of barytes and galena.
7. Quartz in drusy cavities and mammillary forms, with some galena attached to the quartz.

The mode of occurrence of ores at New Ishmael on Palmer tract, is very similar to the last, and to the others just above named. At Mineral Point are interesting exhibitions of replacement of galena by barytes, proven by right angular galeniferous lines traversing barytes. At the Palmer Mines are beautiful forms of calamine crystallized on galena, sometimes entirely enveloping large cakes. The galena at the Palmer Mines also shows drusy cavities, with pretty crystals of cerussite and sometimes also anglesite. The cerussite sometimes covered by hair-like crystals of barytes.

At Mammoth Mines, in Jefferson County, beautiful specimens can be obtained crystallized in the following genetic succession on magnesian limestone: 1. Quartz in minute botryoidal forms; 2. Iron pyrites; 3. Blende; 4. Barytes; 5. Calcite.

The Sandy Mines occur in what is known as the Second Magnesian Limestone, a group of rocks lying next above our sandstone, which we have spoken of in the first part of this article, but as they occur similarly to other lead deposits we have to speak of, we here insert a brief account of them.

At these mines we find a nearly vertical fissure, varying from a knife edge to 15 inches wide; the wall rock is magnesian limestone. The fissure is filled with a gangue of barytes with galena, and has been worked with variable success for many years. The course of the main figure varies but little from a north and south line, and has been traced for several miles. Parallel to this, and but a few hundred feet apart are two other fissures, also galeniferous.

Of a similar character is the Jones Mine, owned by the Kansas City Mining and Smelting Company, 15 miles southeast from Versailles, Morgan County. At this place the vein varies in width from 4 to 18 inches, and includes a gangue of barytes in vertical sheets, crystallized at their junction, and bearing galena near its southern exposed portion. It can be traced for three-quarters of a mile north and south. The vein can be easily traced out, but only near its southern exposure is galena found.

In Benton County we find a similar fissure vein, and bearing nearly the same magnetic course which has also been traced for three-quarters of a mile. Its minerals are iron pyrites, galena, and blende. These "leads" or "fissure veins," originate in cracks in the rock, probably all owing to the same prime cause, and to the same cause as that which created the place for the "run" on Old Mines tract, and the "runs" or "leads" near Potosi, and the Virginia Mines in Franklin County.

June, 1876.

NOTES.

COPPER DISCOVERY IN ALABAMA.—It is reported that a rich copper mine has been discovered in Cleburne County, Ala.

THE PADDOCK COPPER COMPANY of Lyman, N. H., have sunk a shaft 160 feet, and have already raised 500 tons of ore.

PETROLEUM STATISTICS FOR MAY AND JUNE, 1876:

	May, 31 days.	June, 30 days.	Increase.	Decrease.
Stock on hand at the wells, bbls.	179,146	174,934	.....	4,212
Production for the month	735,351	723,600	.....	11,751
Daily production	23 721	24,120	399	.....
Producing wells	3,930	4,527	597	.....
Drilling wells	303	340	37	.....
Stock in iron tanks and pipe lines	3,700,039	3,494 829	.....	205,210
Stock held by refiners	110 719	121,879	11,160	.....
Total stock	3,989,904	3,791,642	.....	198,262
Total shipments	646,150	921,862	275,712	.....

—*Stowell's Reporter.*

READING RAILROAD ENTERPRISE.—The city correspondent of the Germantown *Telegraph* says that the Reading Railroad Company, at the solicitation of the grain trade members of the Commercial Exchange, have determined to erect a grain elevator of its own on the Delaware River front of the company's property, for the use of the through traffic from the West to Europe via the new route, of which the Erie Railroad is the trunk. Three companies are concerned in the Philadelphia terminus of the Erie Line, that is the Reading, Lehigh Valley, and North Pennsylvania. Of these the Lehigh Valley is the leader, having assumed the expense of laying the third rail on the Erie Line west of Waverley. But the Reading has the only water-front suitable for the shipping business, and seems disposed to act alone and secure to itself the benefit of the through trade. The through passenger business by the new route is transacted by the North Pennsylvania. The Reading Managers have for years past been contemplating the through Western trade by the Erie route, and now that that is available at last, they are not disposed to lose any time in securing it, being satisfied that the coal trade alone cannot be permanently relied on to pay a profit in so great an investment. It is probable that in time grain elevators and storage warehouses, both for provisions and breadstuffs, will be erected at Richmond and Willow Streets, and that the Reading Company will renew its application to Councils for permission to extend its tracks, and run its trains along Delaware Avenue from Richmond to Willow Streets.

ASSESSMENTS AND DIVIDENDS.

WE compile, principally from the San Francisco *Stock Report*, the following list, showing the total amount of assessments levied and the aggregate dividend disbursements of those companies in active operation, up to the close of the first half of the present year:

Name of Mine.	No. of feet on vein.	Total No. of Shares.	Assessments. No. of.	Assessments. Total sum levied.	Assessments. Date of last assessment.	Dividends. No. of	Dividends. Total sum disbursed.	Dividends. Date of last payment.
California Mines.								
Mansfield	3,300	66,000	5	$89,100	May 19, '76	..	.....	.....
New Coso	....	100,000	3	150,000	May 9, '76	..	.....	.....
St. Patrick	1,800	2 ,000	11	1 0,000	Aug. 12, '75	1	$60,000	Mch. 10, '74
Washoe Mines.								
Amazon Consolidated	1,500	60,000	2	21,900	Feb. 24, '76	..	.....	.....
Alta	600	108,000	3	75,600	Jan. 27, '76	..	.....	.....
Baltimore Consol	1,050	84,00	11	657,000	Mch. 23, '76	..	.....	.....
Best & Belcher	1,040	104,000	21	660,400	April 14, '71	38	15,397,200	April 10, '76
Buckeye	3,000	48, 00	17	284,0.0	May 19, '76	..	.....	.....
Caledonia	2,188	109,020	17	1,110,000	April 15, '76	..	.....	.....
California	....	....	..	....	....	1	2,163,000	June 15, '76
Chollar Potosi	1,40	98, 00	10	1,282,000	June 26, '76	44	3,780,000	Feb. 10, '72
Columbia	1,200	100,000	1	25,000	April 13, '76	..	.....	.....
Consolidated Virginia	71.	540,000	15	411,200	June 11, '73	26	19,440,000	June 12, '76
Cosmopolitan	1,80	10 ,000	3	75,000	May 1, '76	..	.....	.....
Crown Point	541	100,000	26	973,370	Jan. 13, '76	50	11,588,000	Jan. 12. '75
Daney	2,000	108 000	1	16,200	May 15, '76	2	56,000	July 1, '63
Dardanelles	1,200	60,000	3	180,000	Jan. 12, '76	..	.....	.....
Europa	1,00	1 0,000	6	110,000	June 19, '76	..	.....	.....
Florida	1,200	40,00	5	175,000	" " "	..	.....	.....
Glasgow	1,500	60,000	2	21,0 0	Feb. 24, '76	..	.....	.....
Globe Consolidated	4,30	38,000	8	199,500	April 20, '76	..	.....	.....
Gould & Curry	612	108,000	26	1,910,000	May 18, '76	3	3,826,800	Oct. 10, '70
Green	1,634	20,000	13	10,000	Jan. 3, '76	..	.....	.....
Hale & Norcross	400	112,000	50	2,018,000	May 16, '76	36	1,598,000	April 10, '71
Jacob Little Consol	3,280	100,000	2	60,00	Feb. 14, '76	..	.....	.....
Justice	2,100	105,000	18	977,50	Mch. 3, '76	..	.....	.....
Knickerbocker	1,20	1 0, 00	15	396,020	Mch. 31, '76	..	.....	.....
Kossuth	2,700	108,000	6	351,000	May 29, '76	..	.....	.....
Lady Bryan	2,000	100,00	12	625,00	May 26, '76	..	.....	.....
Lady Washington	1,200	60,000	5	198,000	Jan. 27, '76	..	.....	.....
Leviathan	2,000	1 0,000	3	150,000	May 19, '76	..	.....	.....
Mint	1,200	50,000	13	90,00	April 21, '76	..	.....	.....
Nevada	1,200	40,000	2	14,02	Mch. 30, '76	..	.....	.....
New York	1,00	100,000	9	570,000	Mch. 28, '76	..	.....	.....
Niagara	1 00	60,000	4	39,000	Jan. 12, '76	..	.....	.....
North Carson	1,500	100.0 0	4	70,000	April 2, '76	..	.....	.....
New Cons. Virginia	1,500	100,000	3	100,000	June 3, '76	..	.....	.....
Original Gold Hill	3,000	30,000	3	82,50	Feb. 12, '76	..	.....	.....
Overman	1,200	38,00	35	1,107,080	June 26, '76	..	.....	.....
Phil Sheridan	1.2 0	20,000	4	60,000	May 6, '76	..	.....	.....
Pict n	2,000	30,000	1	73,200	May 24, '76	..	.....	.....
Prospect	1,000	100,00	1	100,000	April 24, '76	..	.....	.....
Rock Island	1,200	10 ,000	11	330,000	June 26, '76	..	.....	.....
Savage	771	112,00	24	2,746,000	May 31, '76	52	4,460,000	June 11, '69
Segregated Belcher	160	6,400	13	244,800	April 11, '76	..	.....	.....
Senator	1,200	24,000	13	111,600	Feb. 29, '76	..	.....	.....
Segregated Gold Hill	1,000	60,000	1	12,00	Jan. 12, '76	..	.....	.....
South Comstock	1,636	40, 00	4	44,000	May 3, '76	..	.....	.....
Sierra Nevada	3,300	100,000	44	1,300,000	May 23, '76	11	102,500	Jan. 16, '72
Succor M. & M. Co	3,800	68,400	14	40 ,700	April 17, '76	2	22,800	Oct. 16, '71
Trojan	1,200	100,00	2	80,000	June 14, '76	..	.....	.....
Union Consolidated	600	10,0000	9	260,000	Mch. 3, '76	..	.....	.....
Utah	1,000	20, 00	12	340,000	Feb. 18, '76	..	.....	.....
Wells, Fargo	1,500	108,000	4	49,400	Jan. 26, '76	..	.....	.....
Woodville	1,700	120,000	13	801,000	Jan. 2 , '76	..	.....	.....
Yellow Jacket	957	120,000	32	2,478,000	Mch. 18, '76	25	2,184,000	Aug. 10, '71
White Pine.								
Geneva Consolidated	3,000	50,000	7	82,500	Mch. 4, '76	..	.....	.....
Idaho Mines.								
Empire	....	25,000	12	307,500	Jan. 5, '76	..	.....	.....
Golden Chariot	1,82	90,000	16	622,500	Feb. 19, '76	13	500,000	Oct. 24, '73
Ida Ellmore	....	30,000	20	7 0,000	June 26, '76	6	60,000	Feb. 8, '70
Pauper	1,60	50,000	7	35,000	Feb. 26, '76	..	.....	.....
Poorman	....	50,000	6	175,000	May 19, '76	..	.....	.....
South Chariot	600	50,000	17	377,500	May 26, '76	..	.....	.....
War Eagle	1,000	20,000	11	130,000	Feb. 4, '76	..	.....	.....
Cornucopia District.								
Cornucopia Consol	3,000	100,000	1	10,000	Mch. 14, '76	..	.....	.....
Hussey	4,500	100,000	1	15,000	Apr. 15, '76	..	.....	.....
Leopard	1,500	50,000	1	50,000	Mch. 31, '76	3	87,500	Feb. 15, '76
Beaver	1,500	52,000	1	5,000	May 20, '76	..	.....	.....
Ely District.								
American Flag	....	40,000	8	280,000	Jan. 17, '76	..	.....	.....
Alps	800	30,000	8	105,000	Feb. 10, '73	3	37,500	April 15, '76
Huhn & Hunt	3,600	30,000	12	306,000	Mch. 9, '76	..	.....	.....
Meadow Valley	....	60,000	11	33,0 0	Apr. 26, '76	17	1,360,000	June 16, '73
Pioche	1,000	20,000	13	250,000	Jan. 19, '76	3	60,000	Aug. 5, '72
Silver West Consol	...	50,000	6	47,500	May 24, '76	..	.....	.....
Miscellaneous.								
Adams Hill	....	50,000	7	69,500	May 2, '76	..	.....	.....
Belmont	....	50,000	8	350,000	Mch. 28, '76	..	.....	.....
Cherry Creek	1,000	37, 00	1	90,000	June 27, '78	..	.....	.....
Coso Consolidated	4,500	100,000	1	37,000	Mch 8, '76	..	.....	.....
Eureka Consolidated	...	50,00	2	120,000	May 26, '76	22	1,000,000	Aug. 5, '75
El Dorado South Con	2,600	40,000	9	437,500	Mch. 23, '76	..	.....	.....
General Thomas	2,100	50,000	1	25,000	May 10, '76	..	.....	.....
Jefferson	8,182	50,0 0	1	37,500	May 5, '76	2	50,000	May 15, '75
Jackson	...	30,000	5	127,500	Feb. 25, '76	..	.....	.....
Juniata Consolidated	5,000	5 ,000	4	107,5 0	Jan. 27, '76	..	.....	.....
Northern Belle	1,600	50,000	..	....	....	13	650,000	June 15, '76
Prussian	1,000	30,000	3	142,500	Mch 14, '76	..	.....	.....
Webfoot	3,800	50, 00	2	35,000	Apr. 14, '76	..	.....	.....
Total				$31,228,950			$67,680,300	

The above figures indicate an excess of $36,451,650 dividends over assessments. Of this amount $46,425,200, or over two-thirds of the whole, was paid out by three companies, viz.: The Consolidated Virginia, Belcher and Crown Point.

The past six months has witnessed an unusual impetus in the development of our Western mines owing largely to the rich discoveries in the Comstock lode, and partly to rich discoveries in other fields. The assessments for this period therefore have been unusually large, much of the capital thus raised has been invested in heavy machinery for the deep Comstock mining, and for their extensive works.

THE SALT LAKE CITY SILVER ORE MARKET.

Mr. J. B. MEADER, assayer, gives the following statement of the ore and metal market for the week ending July 15 :

Argentiferous Lead (Base Bullion).—$80 per ton for lead; $1.08 per oz. for silver; $20 per oz. for gold. The above quotation for silver is based upon a silver contents in the lead of 80 to 100 oz. per ton of 2,000 lb.

Argentiferous Lead Ores.—From 90c. to $1.00 per oz. for the silver contained therein based upon a standard of 40 per cent. lead, each unit above 40 per cent. 50 cents per unit added. Each unit below 40 per cent. 50 cents deducted. Extreme prices, and only for most desirable carbonate ores, free from zinc, copper, and antimony. Ores containing zinc—For each unit of zinc above 5 per cent., deduct the value of 1 oz. of silver. Ores with a lime or ferruginous gangue subject to higher rates. Copper in all the above ores objectionable.

Copper Ores.—Assaying 20 per cent. net assay, $1.40 per unit (or per cent.); assaying 25 per cent. net assay, $1.70 per unit (per cent.); assaying 30 per cent. net assay $1.92 per unit (per cent.); assaying 35 per cent. net assay, $2.30 per unit (per cent); assaying 40 per cent. net assay, $2.25 per unit (per cent.); assaying 45 per cent. net assay, $2.35 per unit (per cent.); assaying 50 per cent. net assay, $2.45 per unit (per cent.) per ton of 2,000 lb. To obtain the net assay, 1 and 3-10 per cent. is deducted from the wet assay. Silver has improved somewhat during the week, yet it is by no means settled that it will not still further decline; therefore buyers are slow to take up engagements for the future, and are only purchasing from day to day; this makes the market unsettled and panical

Shipments of base bullion for the month of June	4,002 468 lb.
" " " 5 months of 1876	14,485,298 "
Total for six months	18 487,766
Ore shipments for six months reduced to lead	1,263,429
Total production of lead	19,751,195

RENO (NEVADA) RATES,

For the payment of silver ores are as follows :

Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.
$40	25	$57	35	$88	45	$129	55	$200	65	$350	75
42	26	58	36	90	46	133	56	210	66	375	76
44	27	59	37	93	47	137	57	220	67	400	77
46	28	60	38	95	48	142	58	230	68	450	78
48	29	66	39	98	49	146	59	240	69	500	79
50	30	70	40	100	50	150	60	250	70	600	80
52	31	73	41	107	51	158	61	263	71	700	81
54	32	76	42	112	52	166	62	275	72	800	82
55	33	80	43	119	53	175	63	288	73	1,000	83
56	34	84	44	125	54	188	64	300	74		

The above are the standard rates, and are used as a basis from which the prices of silver ores throughout the West are calculated

MINING NOTES FROM CALIFORNIA, IDAHO, AND MISSOURI.

CALIFORNIA.—The *Dutch Flat Forum* of the 13th inst. says with regard to the Hydraulic Mines in that district: The *Pacific, Central, Elmore Hill, Dunning, Polar Star, Boston, Franklin, Lakamp* and *Summerset* claims are all being energetically worked and are pressing forward for the prize of the larger profits which can be realized in warm weather; in the cold and frosty days of Winter, the mercury congeals and refuses to amalgamate with the gold.

This is the harvest time with the hydraulic miner and lucky is he who has sufficient water to run through the Summer.

The Cedar Creek Mining Company, is drawing on its reservoirs to keep up the supply of water and in a few days we may expect that the Yuba will be so low that the Miner's ditch will be empty.

The South Yuba Canal Company, having their immense reservoirs, can run later. It is a question, however, this season, whether it can make up for lost time, the ditch last Winter was broken about two months in all, so that in order to keep even with the Cedar Creek Company, as regards time, it is necessary that it should run water about seven weeks later, as there appears to be a rivalry on this question this is worth noting.

The Yankee Tunnel is being driven with vigor. It was advanced 130 feet last month at a cost of $2,398, being an average of $18.45 per foot. The size of this tunnel is 8x9 feet. It is now into the hill, 1,400 feet. At the present rate of speed the Superintendent will have no difficulty whatever in carrying out his plan of reaching, and washing through the Baker shaft next season.

IDAHO.—The *Silver City Avalanche* of July 1st says: *The Poorman Mine.*—The developments of this mine continue to be of the most cheering and encouraging character. Superintendent BLEDSOE is working his limited force to the very best advantage, and there is now no doubt of the fact that they have approached a well-defined ore body which will turn out to be as rich and productive as that which made the Poorman the pride and glory of War Eagle Mountain some ten years ago. We saw some rock this week that came from the winze in the seventh level, 500 feet north of the shaft, and also some from a point directly under the spot where much of the rich ore was taken when the Poorman did its former flourishing business. It is unmistakably rich in black sulphurets of silver, and much of it is well lined with streaks of gold. If the Poorman had been judiciously worked in the past, there is no doubt that this rich ore body would have been discovered many long months ago. It is not too late, however, to make it available. Let the Poorman be worked honestly and on its merits, and we believe its bullion products will astonish and gratify every man directly, or indirectly, interested in the success of the mine.

The Potosi Mine.—Recent developments in this mine are most promising and satisfactory. At a distance of 280 feet in the tunnel, the ledge is about 30 inches wide at the bottom and from 15 to 18 inches at the top. There has been good milling ore all along the tunnel, and it greatly improves in quality as the work progresses, coming up fully to the expectations of Mr. PECK, the owner of the mine, who pronounces it the finest and most promising ledge in the camp. The rock shows up in pyrites of copper and iron with abundance of silver and considerable gold. A connection will soon be made with the shaft, when the ore will be taken out at the rate of 20 tons per day.

The Golden Chariot Mine.—The encroachments of the water in this mine are being successfully fought. The great heat of last week, and the consequent snow melt, caused a flood in the lowest levels. A syphon 800 feet in length, which raises the water nearly 14 feet, was put in from the 8th level bulkhead and run over into the Minnesota, which divides the force of water between the two works. Superintendent BALDWIN states that the water will be driven from the mine within five days, and the men will be at work as usual on the 12th and 13th levels. There is a large amount of bullion ready for shipment, and when the floods have subsided every department of work will be resumed as usual.

MISSOURI.—*Granby Miner.*—*The Dayton Lead Mines* are beginning to show evidences of becoming a point of more than ordinary interest. These mines are situated in Newton County, two and a half miles north-west of the town of Dayton. A steam pump is now in operation, and it is the intention of the proprietors to furnish the miners with pumps sufficient to control the water and insure the profitable working of the ground. Already upward of fifty miners are at work with fair prospects, and some seven or eight shafts are paying handsomely. The new smelting works will soon be completed. About 35 000 pounds of mineral are now stored in the bin. None of the shafts have been sunk more than thirty feet, and mineral is found from the grass roots down. The ground is easily worked and but little blasting is necessary. A number of experienced miners have visited these diggings and returned convinced that they will pay.

NOTES.

THE SILVER MINE AT NORTH OXFORD, MASS., is being worked by a Providence company.

THE NICKEL MINE OF MR. SEALS, near Pottersville, N. J., is said to be developing finely, and now shows a splendid vein three feet wide.

THE RUSSELL (North Carolina) GOLD MINE has been transferred to an English company, who intend to construct a 60-stamp quartz mill, with the design of treating low grade ores cheaply, but on an extensive scale.

THE NEW GLASGOW COPPER MINING COMPANY, prospecting near Lochabar Lake, Antigonish County, N. S., struck what is familiarly known as the "big boulder" lead, recently. It shows rich ore, and is about six feet thick. This makes the fourth lead now opened on this property, all within a few feet of each other. This promises to be one of the most valuable discoveries in mining properties in our province.—*Halifax Chronicle*, June 29th.

THE KING'S MOUNTAIN GOLD MINE, that has never until recently earned a profit, is now running 20 stamps, and obtaining a monthly yield of $3,000. The company has 20 additional stamps that will find employment as soon as the hoisting facilities can be completed, the body of ore in sight being sufficient for the purpose. The fact that our own people are so strongly prejudiced against mining affords our foreign friends a free field in all parts of our country east of Nevada, and they give a preference to North Carolina because of the abundance of the ores, the low rate of wages, the general cheapness of living, and the uniform mildness of climate that permits the uninterrupted prosecution of work throughout the year.

PROPOSED CONTINUATION OF THE EXPERIMENTS OF THE LATE PROF. WALT. R JOHNSON ON AMERICAN COALS.—The National Academy of Science has prepared a memorial to Congress asking for a continuation of these extremely valuable experiments, to be extended to the coals of the Mississippi, and those of the elevated country beyond, to the Pacific Coast. The principal plea of this memorial is in behalf of the national protection, and the demands of the United States Army and Navy; but the secondary one, in the interest of manufactures and commerce, would present a much stronger claim upon the government. Fuel is the primary necessity of modern civilization—the basis of modern industry, and the development of the resources of the country by investigation, under national direction and authority, is an unquestionable duty of Congress. No one of the numerous publications in the way of statistics ever made by the authority of the United States, has had a larger quotation, or been more practically useful in the arts and sciences, than this original report of Prof. JOHNSON, and an equally well considered document which should embrace the *fuel*, and the *fuel* resources of this country would be appreciated in all lands. It is to be trusted that this recommendation of the academy will be liberally responded to.—*Franklin Institute Journal.*

EARNINGS OF BOATMEN AND MINERS IN THE CUMBERLAND COAL FIELDS FOR SEVERAL YEARS.—It is a noteworthy fact that for quite a number of years past there has been no class of men connected directly with our coal traffic who have suffered so many embarrassments by frequent changes in their income from freights and business affairs on the canals as the boatmen. All the disturbing elements of the trade seem to have made a drive at them; and upon them has fallen a large percentage of the reductions that have been made from time to time in carrying our coal to market. A brief sketch of the past ten years will bring this fact out very prominently. Prior to the war the lowest rate for freight per ton was $1.10, and the average amount paid was about $1.15 per ton. During the war they were paid a high price for carrying coal, because the personal danger to themselves was great, as was also the risk of the boat's being captured and burned by the Rebs and the stock carried off. In 1864 they received $3 a ton to Georgetown (very little coal was taken to Alexandria during the war). On the 5th of June, 1865, they were reduced to $2 a ton, and in the Spring of 1866, to $1.60. On the 18th of April, 1867, they began carrying coal to Georgetown at $1.40. On the 24th of the same month they were reduced to $1.30. This was received until August 4, 1868, when their earnings took an upward rise to $1.50. In the Spring of 1869, the ruling payments to Georgetown and Alexandria were $1.45 and $1.50 respectively, remaining in force until August 28, 1871, when they received $1.40 and $1.45, continuing until April 18, 1872, when the companies paid $1.35 and $1.40. On March 29, 1873, the charges advanced five cents a ton, and the amount paid was $1.40 and $1.45. This year will be remembered as one in which the figures were shifted a number of times; on April 28, they dropped to $1.35 and $1.40, and on July 29, they were reduced five cents. The last reduction brought a strike among the boatmen, which lasted one week and resulted in their carrying their point and securing an increase of five cents a ton The season closed with the companies paying $1.34 and $1 40, which price continued until June 2, 1874. At that time it was discovered that one of the companies, "nameless here forever more," was exacting a drawback of $10 a boatload from its men out of consideration for dispatch. The other companies refused to pay the old rates under such circumstances, and a strike among the boatmen ensued to prevent the boatmen of that company leaving with cargoes. This strike, accompanied by some violence, continued until August 18, the men then going to work at $1.20 and $1.25. The bonus matter again came to the front and on August 24, a strike occurred, the boatmen demanding $1.40 and $1.15. This continued until September 5th, at which time all the companies acceded to the trumpet-call of the boatmen.

During the Fall of 1874 the Boatmen's Union was formed, and disbanded, by the way, the next year. In the Spring of 1875 the Baltimore and Ohio Railroad Company made a reduction of twenty-five cents a ton on the price of carrying coal to the seaboard, which necessitated a reduction all around, the boatmen carrying coal for $1.25 and $1.30, and the Canal Company acquiring the wharves, with the discontinuance of wharf charges.

On July 13, it once more leaked out that a certain company was demanding a drawback of $10 a load from its men, the upshot of which was that freight went down to $1 20 and $1.25. On August 3 it dropped still lower, to $1.15 and $1.20, with "cut" rates as low as $1.10. The present Spring opened with $1 a ton to boatmen inscribed on the fair and blameless pennon of the Consolidation Company, and that account has been the prevailing rate so far, though "cutters" have in some cases found some ill-starred boatman, who, with the specter of imminent starvation before him, could be induced to boat for ninety cents a ton. The wages paid the miners have not been subject to that fluctuation so noticeable in the earnings of the boatmen. During the war they received $1 a ton, and this was reduced at the close of the same to seventy-five cents. In 1866 the companies attempted to reduce them to fifty cents, and failed in so doing. A compromise was reached, however, placing the price of mining, per ton, at sixty-five cents, which amount is now given. The attempt of the companies to reduce, this Spring, to fifty-five cents, failed entirely, as our readers are well aware. The cost of digging coal before the war was thirty cents a ton.—*Columbian* (Md.) *Alleganian*, July 14, 1876.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending July 15.

Tons of 2,240 lb.	1876. Week.	1876. Year.*	1875. Week.	1875. Year.*
Wyoming Region.				
D. and H. Canal Co	50,815	971,072	61,730	1,712,249
D. L. and W. RR. Co.	39,200	690,712	71,344	1,651,771
Penn. Coal Co	28,695	477,023	29,598	688,945
L. V. RR. Co.	22,916	463,270	25,658	452,344
P. and N. Y. RR. Co.	—	12,649	3,018	62,069
C. RR. of N. J.	31,905	588,273	40,346	379,787
Penn. Canal	7,785	154,262	16,653	35,993
	181,316	3,357,261	257,347	4,984,159
Lehigh Region.				
L. V. RR. Co	82,858	1,178,280	65,295	313,464
C. RR. of N. J.	30,528	573,524	31,282	63,488
D. H. and W. B. RR.	2,129	20,616	1,557	36,023
	115,515	1,772,420	98,134	412,975
Schuylkill Region.				
P. and R. R. RR. Co.	141,122	2,050,218	170,611	1,171,823
Shamokin & Lykens Val.	18,914	416,555	33,556	608,010
	160,036	2,466,773	204,167	1,779,833
Sullivan Region.				
Sul. and Erie RR. Co.	10	26,409	—	5,557
Total	456,877	7,622,853	559,648	7,182,524
Increase	—	440,339	—	—
Decrease	102,771	—	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

Perth Amboy business:

	Tons.
Received for the week	23,098
Shipped for the week	19,126
On hand July 15	81,093

Freights to Boston, 90c.; Hartford, 90c.; New York, 35c.

The decrease of shipments of Cumberland Coal over the Cumberland Branch. and Cumberland and Piedmont Railroads amounts to 324,251 tons, as compared with the corresponding period in 1875.

Belvidere Delaware RR. report.

	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	10,563	116,279	9,983
" " " South Amboy	9,886	218,504	31,430
Shipments at Coal Port (Trenton)	7,174	110,152	7,824
" South Amboy	9,299	224,657	103,607

Receipts of Coal at Boston, for week ending July 14, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	1,895	71,524	85,844
Philadelphia	10,096	550,886	374,155
Baltimore	1,010	124,966	146,558
Other places	4,290	258,762	212,971
Great Britain	—	4,620	2,224
Nova Scotia	1,118	18,489	22,371

Shipments of Coal from Richmond, from January 1, 1876, to July 15, 1876, inclusive:

	Week.	Year.
By Cannelton Coal Company	1,094	17,534
" Peytona " "	780	1,845
" Blacksburg " "	—	4,587
" Coal Valley " "	483	7,246
" Other " "	—	4,735
Total tons	2,357	42,947

Coal Shipped at Pictou, N. S., for week ending July 15 1876 ..... 5,109 tons.
Previously exported ..... 62,553 "
Total to date 67,662

The Production of Bituminous Coal for the week ending July 15, was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	46,453	865,750
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	6,874	173,719
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,262	84,565
*East Broad Top	663	37,529
Clearfield Region, Pa.		
*Snow Shoe	422	29,870
*Tyrone and Clearfield	11,798	590,491
Allegheny Region, Pa.		
*Pennsylvania RR	3,411	110,112
Pittsburgh Region, Pa.		
*West Penn. RR	2,063	104,938
*Southwest Penn. RR	948	31,259
*Penn. & Westmoreland gas coal, Pa. RR.	11,723	396,717
*Pennsylvania RR	1,403	157,999

* For the week ending July 7.

The Production of Coke for the week ending July 7.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
West Penn. RR	528	24,455
Southwest Penn. RR	8,665	257,527
Penn. & Westmoreland Region, Penn. RR.	1,154	23,758
Pittsburgh, Penn. RR	1,506	99,474
Total	11,853	405,214

COAL TRADE REVIEW.

NEW YORK, FRIDAY EVENING, July 21, 1876.

Anthracite.

The old story of no business reported by some, and improving transactions quoted by others, has become monotonous. The fact is the temperature during the last three weeks has been so excessively high, that human nature revolts at encouraging the production of heat giving substances, especially when they are fuels possessing so high a calorific power as Pennsylvania anthracite. To this must be attributed the general dullness in the coal trade, and the indifference which is shown by consumers to the decrees increasing the price of anthracite.

The announcement of an advance of 15 cents per ton for August has brought out a few buyers and perhaps a few more will follow next week; after which, business will probably settle down to as great quietness as has ruled this year. It is quite evident that advancing the price of coal in such times as these is not the way to encourage trade. Manufacturers who have already found the cost of production so high, that many of them are running their mills at a loss, are not likely to purchase a great amount of fuel at an advance even though there be a prospect of a further and much greater one. We do not contend that a reduction in the price of coal would immediately create a great revival in this business, but we do contend that cheap fuel is quite essential to the establishment of a foundation for a revival. The reduction in the price of coal not only shows a saving to the manufacturer in his fuel account, but also in nearly every article that is used or consumed in a manufacturing business; so that the advantages of cheap fuel are much greater than generally admitted, they are in fact incalculable. We are aware that a large proportion of the coal producers realize this fact, but there is a disinclination on their part to alter the programme as laid down for this year's business. There are many, however, who continue to meet the situation so far as it is in their power, by selling such coal as they are permitted to mine, at prices very much under circular rates.

The production last week was 456,877 tons as against 559,648 tons for the corresponding week of 1875, showing a loss for the week this year of 102,771 tons. This leaves the shipments from January 1st, as compared with the corresponding period of last year, but 440,329 tons in excess. As work at the mines is largely suspended this week, the next report will show but a very small excess, which will be almost, if not entirely, balanced by the first of August. In last week's production the Lehigh Valley Railroad Company figures to the extent of over 23 per cent., while from January 1st its percentage has been 21.

IMPORTANT ACTION OF THE COMBINATION.—At a meeting of the Combination held in Pennsylvania last week, it was resolved, in substance, that, whereas the Lehigh Valley Railroad Company had up to July 1, exceeded its proportion of shipments to tide-water by 80,000 tons, unless this excess be extinguished before the end of August, the several companies in the Combination shall then be relieved from all further obligation to observe the terms of the programme. This very important action has been supplemented by the call for a meeting of the Lehigh coal operators at Mauch Chunk to-day, the result of this has not been reported up to the time of our going to press, but, judging from the past and from a knowledge of the views of several of the more influential operators, it is safe to assume that some measure promising a compliance with the requests of the Combination will be adopted, and the usual announcement that everything is harmonious in the councils of the Combination will be made.

That the Combination will be dissolved does not appear probable. It has proved of incalculable advantage to the coal producers generally, and as we have frequently shown, has regulated prices and the trade with moderation and justice, albeit with a somewhat too sanguine view of the financial condition of the country. None of the companies can afford to enter into open war, and this very weakness is the strongest ground for believing in the continuance of a compact that all admit has in the past stood between the producers and carriers of the coal trade and financial ruin. At the same time, there must clearly be an honest compliance with the spirit of the programme by each of the parties to it, if it is to be considered as binding on any, and there is no concealing the fact that at present it is disregarded either as to production or prices, by more than one of the companies.

We have good reason to believe a very considerable reduction in the price of furnace coal at Mauch Chunk will take place before the close of the season if indeed it has not already been made in some case—$2 and $2.25 per ton are named as probable figures. From all these indications it seems the absolute necessity of the iron trade is at least being recognized, and this recognition comes none too soon, for the lower prices of fuel, and nearer markets for iron at the Western works is building up a rival that threatens to destroy the Eastern iron trade unless speedy relief come in the shape of lower transportation charges and cheaper "stock." Wages at the mines will also be, unquestionably, largely reduced before another season's work commences. It behoves those interested to make note of these signs and govern themselves accordingly.

Bituminous.

There are no new features in this trade, and no business of importance to note. The low rates of freight from Philadelphia and this port have had the effect of attracting a good supply of vessels to Georgetown, and the increased business from that port, which we noticed in our last, continues. With the present rates of freight, bituminous coals can be shipped from Philadelphia and delivered at Boston for $4.60@4.80 per ton, and from Georgetown at $4 90@5.10, while if circular prices for anthracite were maintained, chestnut coal would cost $5.75, delivered, and lump, $5.65, and other sizes still more.

The shipments of Cumberland coal show a falling off last week, as compared with the corresponding week of last year, of 12,971 tons, making a total decrease since January 1, as compared with the like period of 1875, of 324,251 tons. Our latest report from the Clearfield region is for the first seven days of this month, and owing to the large observance of the national holidays, the shipments were not one-half the usual proportions.

GAS COAL.—We note sales aggregating about 3,000 tons of Cannelton caking coal for gas purposes. This coal has already been used with good results in gas making, and will, undoubtedly, establish a commanding position in the trade at an early day.

In Provincial coals there is very little doing, so little, in fact, that we hear of some of the mines being temporarily closed. Some of these coals have been offered, delivered in this market, at $4.12½, currency, without drawing out orders of any moment, while our Pennsylvania gas coals are quoted at $6. It is quite evident, therefore, that even were the duty (75c., gold, per ton) removed, the Provincial coals would never become formidable rivals to our American gas coals, whether of Pennsylvania or West Virginia origin.

* ***Wholesale Prices of Anthracite Coal for July, f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.***

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Weehawken	4 75	4 85	4 95	5 05	5 65	4 95
Pittston at Newburg	4 60	4 70	4 80	4 90	5 50	4 80
Wilkesbarre at Port Johnston	4 75	4 85	4 95	5 05	5 65	4 85
Plymouth, R. A.	....	....	4 95	5 15	5 75	4 95
Susque. Coal Co. at Amboy W.A.	4 75	4 85	4 95	5 15	5 65	4 95
Kingston at Hoboken	4 75	4 85	4 95	5 15	5 65	4 95
Lehigh Coals.						
Old Company at Port Johnston	5 25	....	5 05	5 05	5 65	4 95
Old Company's Room Run "	5 25	....	5 05	5 05	5 65	4 95
Sugar Loaf, Hobok. & Amb. "	5 25	....	5 05	5 05	5 65	4 95
Lehigh Coal Exchange "	5 25	....	5 05	5 05	5 65	4 95
Honey Brook Lehigh	5 25	....	5 05	5 05	5 65	4 95
Beaver Meadow at South Amboy	5 25	....	5 05	5 05	5 65	4 95
Schuylkill Coals at North 9th st., Brooklyn, E. D.†						
Schuylkill white ash	4 75	4 85	4 95	5 05	5 65	4 85
Schuylkill red ash	....	....	....	5 15	5 75	4 85
Shamokin white and red ash	....	....	....	5 25	5 75	4 85
Lorberry	....	....	5 85	5 85	5 85	4 90
Lykens Valley	....	....	6 30	6 30	6 30	5 35

* Contractor's prices are 20c. per ton less.

†The prices of Schuylkill coals for shipment from Philadelphia are 35c. per ton less than at Brooklyn.

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. York.	40c.
" " South Amboy to New York	30@35c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, Rondout, South Amboy and Perth Amboy to New York City and vicinity 50c

Freight by the Pennsylvania Coal Company's boats from Newburg to New York 65c.

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 70	$6 00	$5 30
Lackawanna coal, in yard	5 70	6 00	5 30
Wilkes-Barre, delivered	6 25	6 75	5 75
Lehigh & Locust Mountain, del'd	7 00	7 00	6 00
Schuylkill Red Ash, del'd	7 50	7 50	6 00

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	.... 22 00
American " " "	.... 13 00
Cannelton splint, " " "	.... 8 00
Cannelton Block, " " "	.... 8 00
American Orrel " " "	....11@14
Red Bank Cannel " " "	..... 14 00
Cumberland " " "	..... 7 00

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	3 00	8 50
" " South Amboy	8 50	....
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	4 25	5 75
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	6 00
Fairmount, West Va., " "	4 35	6 00
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va.	....	10 00
" Splint, " at Richmond.	4 50	6 00
" Gas Coal at Richmond.	4 00	5 50
Peytona Cannel, W. Va at Richmond	8 50	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	3 50@3 75	4 90
Cumberland, at Baltimore	3 65@3 80	5 10
Clearfield f.o.b. Canton, Baltimore	3 75@....	5 25

Rockhill Semi-Bituminous and Broad Top, at the mine, per 2,000 lb., 95, f. o. b. Greenwich, Philadelphia, per 2240 lb., $3 60@3 95, according to destination; at South Amboy, N.J., 4 60; New York, 5 00.

Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, per 2000 lb., 95; at Greenwich, Phil., per 2240 lb., 3 75@4 25, according to destination; f.o.b. South Amboy, N. J., 4 75; New York, 5 25.

Foreign Gas Coals.

	Sterling.	Am. cur'cy,
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	2 00	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Baltimore, Md. July 20, 1876.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 72	$4 57
Broken	5 10	4 95
Egg	5 20	5 05
Stove	5 61	5 46
Nut	4 76	4 61
Shamokin. (red or white ash), and "Boston," free burning white ash,		
Egg	5 30	5 10
Stove	5 60	5 40
Lykens Valley, red ash,		
Egg and stove	6 15	5 78

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. .....$6 35@8 00

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point	3 80@4 00
West Virginia Gas f. o. b. at Locust Point	
Youghiogheny Gas, f. o. b. at Locust Point	

Boston. July 15, 1876.

Coal is having a few odd inquiries for small cargoes of both bituminous and anthracite. The drying up of the small rivulets has shortened the water materially at all points, and a very general recourse to steam is imminent. The heavy storms of Sunday and Tuesday have temporarily bridged over the anxiety of a number, but without a heavy rain storm over eastern New England for the next fi days, a sharp demand would almost immediately clean out the pockets here, at Salem, New Bedford, and Providence. There is no snap to the petty business that is doing, prices rule low and irregular, hence the buyers who would bid generously are intimidated. Freights are unchanged.—*Commercial Bulletin.*

Cleveland, O. July 20, 1876.

Specially reported by Messrs. BATES & MARTIN.

Herewith find quotations of our market:

Per ton of 2000 lb. f. o. b. vessels.

WHOLESALE.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 10	$4 00
Cannel	4 25	4 15
Blossburgh	$5 00	$5 00
Briar Hill, Block Coal	3 50	3 25
Straitsville Coal Co., lower vein	3 00	2 90
" " " whole "	2 90	2 80
Hocking Valley	2 90	2 90
Massillon	3 00	3 00
Tuscarawas Valley	2 65	2 60
Columbiana	2 65	2 60

Office of CLEVELAND COAL EXCHANGE,
89 Seneca Street, June 3d, 1876.

PRICES TILL FURTHER NOTICE.

	1 to 10 tons.	10 tons upw'd.
Massillon, Brier Hill and Mineral Ridge, lump.	$4 50	$4 25
" " " " " nut	4 00	3 75
Straitsville Lower Vein, Hocking & Shawnee, l'p.	4 00	3 75
" " " " nut	3 50	3 25
Del Carbo and Rich Hill, lump	3 75	3 50
" " " " nut	3 25	3 00
Maple Hill, lump	3 50	3 25
" " nut	3 25	3 00
Columbiana, lump	3 25	3 00
" nut	2 75	2 50
Lackawanna and Wilkesbarre, egg and grate	7 50	7 30
" " stove	8 00	7 75
" " chestnut	7 75	7 50

No Anthracite coal to be sold for future delivery except it be subject to Exchange price at time of delivery.

H. E. CHUBB, Secretary.

Chicago, Ill. July 18, 1876.

Prices remain unchanged.

Cincinnati, O. July 20, 1876.

Reported by our Special Correspondent.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½@8c.	—
Pomeroy coal	5 @6c.	—
Kanawha "	7 c.	—
Cannel coal, according to quality	11 @16c.	—
The following are the retail prices delivered		
Youghiogheny	10c.	—
Pomeroy	9c.	—
Cannel	14@22c.	—
Kanawha Semi-Cannel	10c.	—
Anthracite, per ton	10 50@11 00	—
Coke, at yard	7c.	—
Coke, hard and soft, delivered	9@10c.	—

Erie, Pa. July 20, 1876.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. July 20, 1876.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

White River, per ton	$2 50	Peytona cannel, per ton.	5 75
Brazil Block, "	2 50	Indiana Cannel	4 50
Highland, grate, "	2 25	Hocking Valley	4 25
Block coal, nut, per car	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 35	Nut	8 50
Egg	8 35	Stove	8 75

Lehigh Anthracite.

Broken	9 75	Nut	9 50
Egg	9 75	Stove	10 00

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	13	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	13	Virginia "	27
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$9 75 per ton,
Lehigh, retail	$11 50 per ton.

Louisville, Ky. July 20, 1876.

Specially reported by Messrs. BYRNE & SPEED.

Please report our prices as follows:

WHOLESALE.

	per bushel		per bushel
Pittsburgh	12c.	Pine Hill	
Raymond City	9c.	Kentucky	8c.

RETAIL.

	per bushel		per bushel
Pittsburgh	12c.	Peytona Cannel	20@22c.
Raymond City	11c.	Buckeye "	20c.
Pine Hill	13c.	City-made Coke	10c.
Kentucky	10c.	Anth., per ton, $10 00 to 10 50	
Screened ittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. July 20, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	7 00

New Orleans, La. July 15, 1876.

Reported by C. A. MILTEBERGER & Co.

We quote:

Pittsburgh coal, retail, per bbl	....
" wholesale	30c.
" steamboats, per box	40c.
" to manufacturers, per bbl	45c.
" shipments, per hhd	$5 25
Anthracite, wholesale, per ton	....
" retail, "	12 00
Virginia Cannel, per bbl	80c.
Scotch " "	80c.
Mt. Carbon, wholesale, per bbl	....
" " retail, "	50c.
St. Bernard wholesale, per bbl	30c.
" retail, "	50c.

Richmond, Va. July 17, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Prices are now as follows:

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 00
" semi-Cannel	4 00	Clover Hill Coal	3 50
Coalburgh Splint	4 00	James River Bitum	3 30
Lewiston "	4 00	" " Carbonite,	5 00
Kanawha Gas coal	3 90		

San Francisco, Cal.

From the *Commercial Herald*, July 13, 1876.

Imports from Jan. 1st to July 1st:

	tons.		tons.
Anthracite	7,622	Vancouver Island	51,531
Australian	37,294	Rocky Mountain	132
Coos Bay	19,949	Seattle	49,859
Cumberland	3,599	Bellingham Bay	11,320
English	10,831	Chili	2,076
Mt. Diablo	54,601		

Pacific Coast supplies continue to come forward in considerable quantities, including imports from British Columbia. The market, for reasons before given, favors the buyer. The product of the Seattle mines is notably large. Imports from New South Wales for six months past show a very considerable falling off as compared with same period in 1875. The product of the Victoria (B. C.) mines has largely increased during the year, particularly from the Wellington Mine. The Seattle Mine is under contract to furnish the Central Pacific Railroad large supplies, and the Nanaimo mine is now seeking to supply the Pacific Mail Company with its superior steam product at $8@9, taking the place of Wellington, which for a year past has been furnished the Pacific Mail Company at $12. Imports for July embrace the following cargoes: *Sonoma* (Wellington), 1,650 tons; *Blue Jacket* (Nanaimo), 1,860 tons; *California* (Seattle), 1,515 tons; *Lizzie Williams*, do, 1,300 tons; *Europa* (Newcastle, N.S.W.), 576 tons; *Alaska* (Coos Bay), 250 tons; *Theo. Koener* (Nanaimo), 1,600 tons; *Lookout* (Bellingham Bay), 1,250 tons; *British Duke* (Sydney), 1,967 tons; *Johan Irgens* (Nanaimo), 1,200 tons; *Deux Amis* (Wellington), 617 tons; *Great Admiral* (New York), 300 tons; bark *Wigton* (Glasgow), 1,190 tons; etc. The few cargo sales making nowadays are generally *sub r. sa.*, making it very difficult to give the true price or actual quotations. As before published, English steam cargoes to arrive next Autumn have been sold as low as $7@7.50. California (Mt. Diablo), is held at $5.75 for screenings, $7.75 for coarse; Australian, $9@9.50, latter for Wallsend: Coos Bay, Vancouver, Bellingham Bay, Seattle, etc., $9; Anthracite, $12@14; Cumberland, $14 @16—all for spot parcels. We note the following arrivals at the close; *Commonwealth*, 1,840 tons Newcastle N. S. W.; *Brierly Hill*, 730 tons from Nanaimo B. C.; *W. H. Dietz*, 850 tons Seattle; *Empire*, 500 tons Coos Bay; *Delta*, from Newcastle, N. S. W., with 715 tons.

Montreal. July 17, 1876.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

Scotch Steam	$4 60	Cape Breton Steam	$4 00
Pictou "	4 50	Newcastle Smiths	5 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$6 70	Chestnut	6 40
Stove	7 15		

Toronto, Ont. July 17, 1876.

Chestnut	$7 25
Stove	7 50
Egg and grate	7 25
Bituminous coal for domestic use	6 00
" " steam	3 50@5 50
Lehigh Lump and broken	7 50
Blossburgh	6 50

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals, per ton of 2240 lb.	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	2 36	2 22	2 78	2 69	2 92
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	70
‡ Philipsburg, N. J., (46 miles)	89	75	1 31	1 22	1 45
Elizabethp't, (114 m) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	2 00	1 86	2 42	2 33	2 56
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Elizabeth, Cranford, Westfield & Elizabethport, for consumption	2 36	2 22	2 69	2 69	2 92
Jersey City, N. J., (121 miles) and New York, via L. V. RR.	2 30	2 16	2 63	2 63	2 86
Andover, via Delaware, Lackawanna and Western RR.	3 30	3 10	3 70	3 69	3 99
§ Trenton Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	1 34
Trenton, (97 m.) for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $2 14

From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. and L. and S. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware, Lackawanna and Western RR., Morris and Essex Division 1 10

From *Lackawanna Junction* to *Auburn, N. Y.*, (191 m.) for shipment, via Southern Central R.R. in connection with Pa. and N. Y. R.R. 2 41

From *Lackawanna Junction* to ‖ *Weedsport* (201 m.), for *Rochester and Charlotte and Erie Canal* 2 47

From *Lackawanna Junction* to *Sterling* for *Oswego, N. Y.* .. 2 50

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 08

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

The distances in the above table are Computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles, and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

HYDRAULIC MACHINERY AT THE PHILADELPHIA EXHIBITION.—NO. 3.

Special Correspondence of the Engineering and Mining Journal.

CRANE PUMPS.

THIS company, whose works are located in Chicago, exhibit several patterns of pumps, most of which are made for fire or factory purposes. The auxiliary valve pump which they exhibit works very smoothly when running at high rates of speed. The auxiliary valve is worked by means of an attached stem on which slides a tappet rod from the main piston rod. The auxiliary valve is so connected with the main valve that in case the steam does not quickly start in the piston of the auxiliary cylinder above danger of breaking the steam cylinder beds is avoided through the opening of the main slide valve by the direct action of the auxiliary valve upon it.

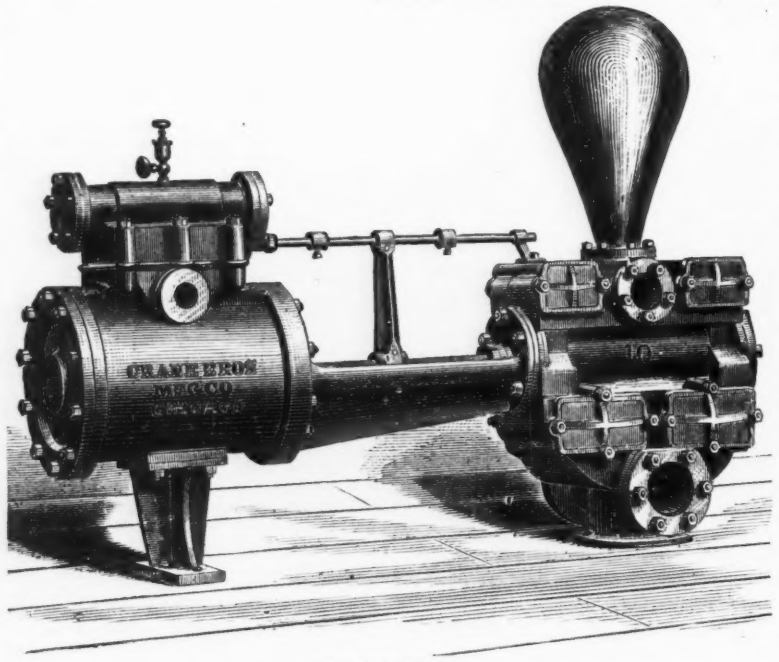
Another pattern of pump made by CRANE BROTHERS is what they call the Duplex Fire Engine Pump. It is an ordinary two cylindered engine, whose piston rods are prolonged so as to work two pump barrels placed back of the steam cylinders. Behind the water cylinders is a fly-wheel and shaft which is driven by connecting rods from the steam piston rods. This pump, although not possessing any novel features of construction, has been working very well since the opening of the Exhibition.

NATIONAL STEAM PUMP.

This is a direct acting pump, with auxiliary cylinder. The piston in the auxiliary cylinder is moved directly by a stem loosely attached to it, which is struck by a tappet rod from the main piston rod. The motion of the auxiliary piston is cushioned by means of spiral springs, which are used in place of confined or live steam, as is common. The water valves, which are of the poppet variety, are placed at the ends of the cylinders. The suction and delivery of the water takes place through long ports cast on the cylinders.

PUMPS WITH INTERNAL VALVE GEAR.

To protect as completely as possible all working parts, some makers of direct acting pumps have constructed the steam valve apparatus so that it is entirely concealed from sight. The opening of the main steam valve, is as usual, accomplished through the agency of an auxiliary cylinder. Motion to the plungers contained in these auxiliary cylinders is produced either through the admission of live or of exhaust steam when raised to a considerable pressure by being used for cushioning at the termination of the stroke of the main piston. One of the most widely known pumps having this kind of valve gear is that made by CAMERON of New York, but for some reason he makes no display at the Exhibition.



CRANE PUMP.

L. D. GREEN PUMP.

Several of these pumps, which are made by BAGLEY & SEWALL, of Watertown, N. Y., are in operation at the Pump Annex. The case of these pumps consists of a short, horizontal cylinder, having a concentric ring, which divides the interior into two spaces, the outer being an annular one, while the inner is merely a small cylinder through which revolves the driving shaft. To this driving shaft is keyed a disk, to which is fastened an eccentric ring, which revolves in the annular space between the case and its internal ring, in such a manner that it always bears on them both at the same time. The internal fixed ring and the casing are both cut away on the same horizontal line, and across this cut work two small abutments, which effectually prevent the water, which is taken in from below them, to be carried round and round when the movable disk revolves. These two sliding abutments press against tumblers in which the eccentric disk slides, and which, by the pressure of the water, insure a tight joint. The suction pipe enters the annular space right below these sliding abutments and the discharge pipe is vertically above them. The water is drawn into the spaces, which are both inside and outside the revolving disk, and by it are forced out through the discharge pipe. The space exterior to the disk discharges the same amount as the interior, the space in the latter being made deep enough to have exactly the same area. One end of the driving-shaft has a bearing inside the pump case, while the other is closed by the pressure of the column of water raised against a collar on the revolving disk, which works against a seat in which are cut small grooves communicating with the suction pipe, so that what water escapes from the body of the pump is drawn right back again. The source of greatest loss of power in running these pumps must result from the considerable friction which takes place between the revolving ring and the tumblers which inclose it, and also that which takes place where the sliding abutments work against their seats, and which have to bear the pressure of the whole column of water raised.

PICKERING PUMP.

This pump is made in Stockton, England. Its general construction is like that of the Cameron special pump, the only noticeable difference being a gland which completely covers the piston rod between the steam and water cylinders. In this pump, therefore, no moving parts are visible.

FOULDS PUMP.

The novelty in this pump consists in conveying the exhaust steam from the steam cylinder to the suction pipe of the water cylinder, where it is drawn in with the entering water and condensed. This arrangement is fitted up with two cocks, so that the steam can be condensed in the manner just described, or else exhausted in the ordinary manner into the open air. When stopping a pump having this construction, care must be exercised in shutting off the exhaust steam from the suction pipe, for if this is not done the water will quickly drain out of the suction pipe into the reservoir from which it is lifted. When in good working condition, a vacuum of about 20 inches can be maintained by this method of condensation. The heat also which is contained in the steam is imparted to the water, an advantageous circumstance when the pump is used as a boiler feeder. Where pumps are worked in underground mines, shafts or slopes, the exhaust steam is frequently allowed to escape directly into the air, an arrangement which is objectionable in several respects. It causes much personal discomfort to those who have to be near them, and the effect of the moist steam on soft roof rocks and timbering is very injurious. The Foulds arrangement does away with this difficulty in a very simple manner. When the steam from the boilers contain air, this condensing apparatus must work imperfectly, as the air not being condensable, and collecting in the suction pipes, interferes with the regular action of the pumps.

VALLEY MACHINE COMPANY PUMPS.

These are made almost exclusively for boiler feeding, and are vertical-acting. They are fly-wheel pumps, the steam cylinder setting above the water cylinder, with a yoke on the piston rod, in which works a horizontal crank shaft. The steam valve is worked by a simple eccentric from this shaft. The bed plate supports at one end the two pump cylinders, and at the other the air chambers, on whose top rests one end of the fly-wheel shaft. The suction and delivery valves are inclosed in a box cast on the bed plate between the water cylinder and the air chamber. The water is forced by means of a double acting plunger. Its action is as follows: When the plunger descends, the water which is forced out divides, one-half going through the delivery valve, while the other half is conveyed to the upper side of the plunger, whose diameter is reduced so as to have but one-half the sectional area of the bottom, and when the plunger ascends, the remaining half of the water is forced out into the delivery pipe. This construction is adopted in order to insure a regular motion to the delivery of the water.

ROTARY PUMPS.

Under this heading are included all those pumps in which water is lifted and forced to a height through the agency of one or more revolving pistons fitted with cams, rings, or interlocking arms. They are to be distinguished in general from centrifugal pumps by the fact that they force the liquid which passes through them by mechanical pressure of moving parts, while the centrifugal pumps, raise liquids by means of the momentum which is given to them in passing through the pump. One of the most valuable features in rotary pumps consists in the constant motion in one direction of the fluids which they raise. In the reciprocating pumps there is at every half stroke a loss of power from the arrested motion of the moving parts and the water, while in a well-constructed rotary pump the motion of the water is continuous. This continuous motion of the liquids in one direction does away also with the necessity for suction and delivery valves, which are indispensable in all reciprocating pumps.

Rotary pumps have, however, several defects which prevent them from surpassing all other forms in the amount of useful work done. In the first place, their frictional moving surfaces are large, so that when bearings are tight much of the power is lost from this cause, and when loose the back leakage of water becomes considerable. When revolving disks are used the bearing surfaces perpendicular to the axis of revolution are exposed to unequal wear, those portions nearest the circumferences traveling through much greater distances than those near the axes.

The mechanical difficulties in taking up wear, either on these surfaces or where cams lock together, are very considerable, and in most cases involve a duplication of the parts. Where it is necessary to raise water to considerable heights, these pumps do not generally succeed well, both from the inherent weakness of some of the parts and the loss of water by back leakage. For moderate lifts, and where a small pump, in proportion to the amount of water raised is desirable, the rotary pump is often quite advantageous.

THE CONDÉ PUMP.

This pump, which is made in Philadelphia, uses the exhaust steam when under pressure at the end of the stroke to effect the moving of the plunger in the auxiliary cylinder. This plunger, whose under surface in the center forms the bonnet to the steam valve, works in the auxiliary cylinder, which is cast in one piece and bolted down to the valve seat which is cast on the top of the main cylinder. In case the valve sticks, and does not work automatically, a hand lever, which is placed on the auxiliary cylinder, can be used until the proper action is restored. The steam pipe, instead of being jointed to the valve chest, as is usual, is connected to the main cylinder, the steam passing up through a port to the valve chest. The steam valve and auxiliary cylinder can with this arrangement be removed for repairs or inspection without deranging the steam pipe. The water valves are all placed in a square box, a discharge valve being over each suction valve. The valves are of the poppet variety, their seats are made of composition, which can be easily removed and replaced when worn. When worked with quick stroke the valves are held down to their seats by spiral springs.

THE CALIFORNIA PUMP.

This pump is made by W. D. HOOKER, and in the arrangement of its valve gear does not differ essentially from the one last described.

THE SOUTH-EAST MISSOURI LEAD DISTRICT.*

By G. C. Broadhead, Pleasant Hill, Mo.

THE lead district of South-east Missouri covers an area of over 3,000 square miles, including Maries County on the west, Jefferson on the east, Franklin on the north, and part of Madison on the south, or parts of ten counties.

A general section of the rocks of the south-east part of this region would be about as follows, numbering from the top :

1.	Sandstone (the 2d of Missouri geologists)	20 feet
2.	Chert beds—beds of passage below	125 "
3.	Magnesian limestone, chert and quartzite	100 to 300 "
4.	Lower magnesian limestone	100 to 150 "
5.	Gritstone and lingula beds	50 "
6.	Ozark marble beds	5 to 20 "
7.	Sandstone and conglomerate	5 to 90 "
8. Porphyry } 9. Granite }	Archæan.	

The thickness is approximate, for it is not possible to obtain the correct thickness of the various beds. No. 1 may be seen as detached outliers or loose masses of a hard sandstone or quartzite, and is found on the hill-tops in the southern part of Madison County, in like topographical position in Reynolds County and the western part of Washington County.

No. 2 consists of alternations of chert, clay, and quartzite. It is the formation which contains most of the limonite deposits of Central and Southern Missouri. In Reynolds County shafts have penetrated it 75 feet. Outcrops there and in Madison would indicate it to be at least 125 feet thick. Fossils obtained in various places prove it clearly to be of the age of the calciferous sandrock of the New York system, and Nos. 1 and 2 may also be referred to the age of the 2d sandstone of Missouri.

No. 3 consists chiefly of thick beds of ash, flesh colored and drab magnesian limestone, both coarse and fine grained. These beds, where they occur, in Washington, Jefferson, and the southern part of Madison Counties, contain a good deal of quartz in drusy cavities. In Washington County the limestones are beautifully ramified by a system of connected drusy cavities generally lined with minute quartz crystals arranged in botryoidal and mammillary forms and called "mineral blossom" by the miners. This is the lead-bearing rock of Washington County, but in the southern part of Madison it does not appear to be galeniferous. It is also undoubtedly the equivalent of the lead-bearing rock of Central Missouri, and is known in Missouri geology as the 3d magnesian limestone. In Washington County it is from 200 to 300 feet or more thick, but in Madison probably not over 100. No fossils have been obtained from it in these counties. I would here remark that the line of division between Nos. 3 and 4 is not well defined. It may yet be proved that they belong to the same group.

No. 4 consists of either dark ash or flesh-colored dolomitic limestone generally occurring in thick beds. On Mine La Motte tract this limestone, with the underlying gritstone beds, is 80 feet thick. At St. Jo Mine, St. Francois County, it has been proved to be not less than 200 feet thick. At the lead mines it soon becomes brown upon exposure.

At Mine La Motte a thin band of blue shale is found which abounds in a *Lingula* (*Lingulella*) *Lamborni*, which is regarded as a Potsdam fossil by Palæontologists. Near Fredericktown the lower limestone beds contain this fossil, together with *Scolithus*, *Orthoceras*, and a *Pleurotomaria*. This is the lead-bearing rock of Mine La Motte, Fox Mines, Avon Mines and St. Jo.

No. 5 is a close-grained, even-bedded silicious dolomite, sometimes having drusy cavities lined with dolomite. The various beds seem to be chiefly formed of rounded quartz grains disseminated in a compact dolomitic paste. Its greatest thickness amounts to 23 feet, but it is even sometimes wanting.

No. 6, the marble beds, are not always present ; for in the northern part of Madison County No. 5 rests directly on No. 7. These beds consist generally of fine grained, even-bedded magnesian limestone of gray, red, flesh-colored, buff or mottled white, with red, buff, or drab, the colors sometimes quite beautiful. It admits of a high polish and is quite handsome.

The lowest unaltered sedimentary rock of South-east Missouri is a sandstone generally course grained, although we do find it of fine grain. It also occurs as a conglomerate, formed chiefly of porphyritic pebbles. Its chief outcrop is in the southern part of St. Francois and northern part of Madison Counties, especially on the Mine La Motte tract where we find it directly reposing unaltered on the porphyry, and farther westward on granite. Its greatest thickness is 80 to 90 feet, but is often much thinner. The occurrence of any ore in it is very rare, and only at one place have I heard of a little galena being found.

With regard to the age of these rocks we would call No. 7 (the sandstone) Potsdam. If *Lingula* (*Lingulella*) *Lamborni* is restricted to the Potsdam group, and the *Scolithus*, also occurring in the same bed with the *Lingula*, we should, without hesitation, regard the rocks as Potsdam, but if these fossils are also found in the calciferous group we should prefer to assign all our rocks above the lower sandstone to No. 1, inclusive, as calciferous, for there has thus far been found no well-marked line of division between Nos. 3 and 4, and the late Dr. SHUMARD stated in his reports that No. 3 (the 3d magnesian limestone) undoubtedly contained calciferous fossils.

The oldest rocks of South-east Missouri are the porphyries and granites. We know that the porphyries are older than the above-named rocks, because we have found the lowest sandstone resting unaltered on them, and also upon the granite. We also have found the lowest magnesian limestones resting on this sandstone, and also unaltered upon the porphyry. We therefore have a correct succession of rocks. Our data, thus far, is not sufficient to establish the age of the granites, or whether they are older than the porphyries, but we incline to the belief that they are. Our porphyries, though, are exactly similar to those of Massachusetts and New Brunswick, which are considered Huronian. We, therefore, feel correct in calling ours Huronian. Our granites may be Laurentian.

ORES OF THE ABOVE.

The ores of Nos. 4 and 5 include those of lead, copper, nickel, and cobalt. The oldest worked mines are those of Mine La Motte, where lead was mined soon after the year 1720. At intervals, these mines have been much worked during the present century. The ore occurs disseminated in horizontal limestone beds, throughout an average vertical thickness of 7½ feet. The cap rock and bed rock are of like composition, but contain very little ore. In one portion of the mines, copper ore (chalcopyrite) is quite abundant, and is intimately associated with the galena. At another place we find nickel and cobalt quite abundant. This mine having been formerly particularly described, we pass on to others, simply mentioning that at the Avon and Fox Mines the ore occurs very similarly, and that the formation is of the same geological age. At the Fox Mines much of the galena is found in drusy cavities, associated with pyrites, calcite, and dolomite. But it is of the St. Jo Mines that we wish more particularly to speak. As we have stated before, the rocks are similar to those of Mine La Motte, but the ores are only lead and copper. The rock here is a dense ash-blue magnesian limestone, reposing in nearly horizontal strata. The St. Jo Company at present have two working shafts of 80 and 100 feet depth, the ore-bearing rocks being the lower 25 feet, arranged in tolerably uniform layers of two to four feet in thickness. No vertical veins were observed, but the mineral will sometimes follow vertical cracks. At one place, solid layers of galena, of about three inches in thickness, are intercalated with the limestone beds every few feet ; but the ore is generally disseminated in the limestone. In the copper beds, bands of chalcopyrite are of frequent occurrence. A vertical section at one place shows :

1. Several feet of magnesian limestone, occurring in even beds, and containing a small percentage of disseminated galena.
2. 6 feet of magnesian limestone—no galena observed.
3. 3 inches—sheet of galena.
4. 2½ feet of limestone.
5. 3 feet of limestone with a good percentage of galena.
6. 4 feet—nearly all galena—with a very little limestone.

The Desloge Shaft.—Just adjoining the St. Jo Lead Company's land, and only a few hundred feet north-east, the Missouri Lead Mining and Smelting Company have sunk a shaft 120 feet, and bored 84 feet further, passing through rich galeniferous limestone. A section recorded by the company reports passing through limestone with disseminated galena as follows:

Galena at	33⅓		feet	from	surface.
" "	46		"	"	"
" "	78		"	"	"
" very rich at	78	to 80	"	"	"
" at	81		"	"	"
" a little from	83	to 97	"	"	"
" richly disseminated	103	to 104	"	"	"
" sparsely disseminated	104	to 114	"	"	"
" a good percentage	114	to 116	"	"	"
" a very little to	117		"	"	"
" a good percentage, from	117	to 127	"	"	"
" disseminated, from	129	to 138	"	"	"
" very rich, from	138	to 140	"	"	"
" disseminated, from	140·6	to 140·9	"	"	"
" fair disseminated, from	140·9	to 141·3	"	"	"
" very rich percentage, from	141·3	to 142	"	"	"
" disseminated. from	142	to 151·6	"	"	"
" very rich, from	151·6	to 152·3	"	"	"
" good, disseminated from	152·3	to 154	"	"	"
" lean, from	154	to 155·6	"	"	"
" rich, disseminated from	155·6	to 156·6	"	"	"
" lean, disseminated from	156·6	to 157	"	"	"
" very rich, disseminated from.	157	to 158	"	"	"
" good, disseminated from	158	to 159	"	"	"
" lean, " "	159	to 161·3	"	"	"
" rich, " "	161·3	to 164	"	"	"
" a little ore, from	164·5	to 165	"	"	"
" very rich from	165	to 167	"	"	"
" mineral, from	167	to 175	"	"	"
" lean, from	179	to 182	"	"	"
" disseminated, from	184	to 194	"	"	"
" very rich, from	194	to 197	"	"	"
" some mineral, from	197	to 204	"	"	"

The limestones here lie about horizontal, and it is impossible at present to estimate the probable extent of the galena, but it is undoubtedly very great.

The galena at St. Jo, as at other mines in the lower limestone, is coarsely granular, and cubes are of rare occurrence, but in small drusy cavities very nice crystals of a secondary form are often found. Iron pyrites, dolomite and calcite abound at the Fox Mines. Calcite and dolomite are of general occurrence; barytes, if at all seen, is very rare.

With regard to the origin of the galena in these mines, we would give as our theory that the limestones were first formed in deep seas. That after and during a long period of subsequent time, the galena, in a state of solution, replaced a portion of the limestone beds which had previously been softened by acids. We would not hazard the opinion that the process of replacement was recent, but rather believe it to have taken place in some remote period of time, and probably before the deposition of the galena among the more recent formations of South-east Missouri ; also, that its formation must have continued through a long period of time, for the galena did not replace the limestone in the different beds at the same time, nor is it certain that the process was in progress in different beds at the same time.

ORES IN NO. 3, OR THE 3D MAGNESIAN LIMESTONE.

Some of the mines of St. Francois County, for instance the Vallé Mines, and all of those of Washington and Crawford Counties, occur in these rocks.

The ore occurs either—

1st. In caves or openings.

2d. In leads or lodes.

CAVE OPENINGS.

Although there may be a slight difference in the form or shape of the deposits, still I believe that all the galena ores of this formation, excepting the "*leads*," may come under this head, nor am I certain that the vertical leads should be separated.

The limestones are often bisected by vertical cracks or fissures, crossed by others. These are sometimes narrow, but are often widened out, probably caused by breaking off and disintegration of masses of limestone. The ore and its associated minerals are limited by "runs" and "openings." The "run" is a widening of the opening, and must not be confounded with the runs of South-west Missouri. It is limited above and below with solid limestone, which cuts it off from other runs below, sometimes only separated by a few feet, but at other times much more. These runs may therefore be considered as occupying a part of the same crevice, and shut off from each other by closing up of the walls.

At Prairie Diggings, on "Old Mines" tract we entered a run of 7 feet wide at 55 feet depth, extending in a nearly northern direction as far as explored for several hundred feet. Other short runs or cave openings meet the main run, but generally terminating within a few feet. Others, extending further, develop into similar openings to the main run.

These "runs" or "openings" are filled with masses of decomposed mag-

* A Paper read before the American Institute of Mining Engineers at the Philadelphia Meeting, June, 1876.

nesian limestone, barytes, iron pyrites, galena, and calcite, sometimes confusedly arranged, but often in regular broken horizontal layers, the galena generally preserving a nearly horizontal position in its arrangement, and when disseminated, it is found occupying nearly the same horizontal line. The galena is sometimes inclosed by bands of pyrites, and at other times associated with a gangue of barytes, the latter apparently of more recent age.

A vertical section in the main run at one place shows—

1. Cap rock of magnesian limestone.
2. 1 inch of barytes and galena.
3. 10 inches decomposing magnesian limestone.
4. Streak of iron pyrites.
5. 4 inches of barytes and galena.
6. Streak of iron pyrites.
7. 2-feet mass of barytes, boulders of softened limestone, galena, and streaks of iron pyrites.
8. Bed-rock of magnesian limestone.

At "New Diggings," near Potosi, the galena occurs in a similar association with barytes and pyrites.

The ore at Mineral Point occurs very similar and in irregular-shaped openings. A vertical section in a shaft displays—

1. Clay and chert.
2. Limestone.
3. Red clay, barytes, and a little galena.
4. 10 inches barytes, in nearly horizontal bands with galena.
5. 5 inches magnesian limestone.
6. Thin seam of barytes and galena.
7. Quartz in drusy cavities and mammillary forms, with some galena attached to the quartz.

The mode of occurrence of ores at New Ishmael on Palmer tract, is very similar to the last, and to the others just above named. At Mineral Point are interesting exhibitions of replacement of galena by barytes, proven by right angular galeniferous lines traversing barytes. At the Palmer Mines are beautiful forms of calamine crystallized on galena, sometimes entirely enveloping large cakes. The galena at the Palmer Mines also shows drusy cavities, with pretty crystals of cerussite and sometimes also anglesite. The cerussite sometimes covered by hair-like crystals of barytes.

At Mammoth Mines, in Jefferson County, beautiful specimens can be obtained crystallized in the following genetic succession on magnesian limestone: 1. Quartz in minute botryoidal forms; 2. Iron pyrites; 3. Blende; 4. Barytes; 5. Calcite.

The Sandy Mines occur in what is known as the Second Magnesian Limestone, a group of rocks lying next above our sandstone, which we have spoken of in the first part of this article, but as they occur similarly to other lead deposits we have to speak of, we here insert a brief account of them.

At these mines we find a nearly vertical fissure, varying from a knife edge to 15 inches wide; the wall rock is magnesian limestone. The fissure is filled with a gangue of barytes with galena, and has been worked with variable success for many years. The course of the main figure varies but little from a north and south line, and has been traced for several miles. Parallel to this, and but a few hundred feet apart are two other fissures, also galeniferous.

Of a similar character is the Jones Mine, owned by the Kansas City Mining and Smelting Company, 15 miles southeast from Versailles, Morgan County. At this place the vein varies in width from 4 to 18 inches, and includes a gangue of barytes in vertical sheets, crystallized at their junction, and bearing galena near its southern exposed portion. It can be traced for three-quarters of a mile north and south. The vein can be easily traced out, but only near its southern exposure is galena found.

In Benton County we find a similar fissure vein, and bearing nearly the same magnetic course which has also been traced for three-quarters of a mile. Its minerals are iron pyrites, galena, and blende. These "leads" or "fissure veins," originate in cracks in the rock, probably all owing to the same prime cause, and to the same cause as that which created the place for the "run" on Old Mines tract, and the "runs" or "leads" near Potosi, and the Virginia Mines in Franklin County.

June, 1876.

NOTES.

COPPER DISCOVERY IN ALABAMA.—It is reported that a rich copper mine has been discovered in Cleburne County, Ala.

THE PADDOCK COPPER COMPANY of Lyman, N. H., have sunk a shaft 160 feet, and have already raised 500 tons of ore.

PETROLEUM STATISTICS FOR MAY AND JUNE, 1876:

	May, 31 days.	June, 30 days.	Increase.	Decrease.
Stock on hand at the wells, bbls.	179,146	174,934	.....	4,212
Production for the month	735,351	723,600	.....	11,751
Daily production	23 721	24,120	399	.....
Producing wells	3,930	4,527	597	.....
Drilling wells	303	340	37	.....
Stock in iron tanks and pipe lines	3,700,039	3,494 829	.....	205,210
Stock held by refiners	110 719	121,879	11,160	.....
Total stock	3,989,904	3,791,642	.....	198,262
Total shipments	646,150	921,862	275,712	

—*Stowell's Reporter.*

READING RAILROAD ENTERPRISE.—The city correspondent of the Germantown *Telegraph* says that the Reading Railroad Company, at the solicitation of the grain trade members of the Commercial Exchange, have determined to erect a grain elevator of its own on the Delaware River front of the company's property, for the use of the through traffic from the West to Europe via the new route, of which the Erie Railroad is the trunk. Three companies are concerned in the Philadelphia terminus of the Erie Line, that is the Reading, Lehigh Valley, and North Pennsylvania. Of these the Lehigh Valley is the leader, having assumed the expense of laying the third rail on the Erie Line west of Waverley. But the Reading has the only water-front suitable for the shipping business, and seems disposed to act alone and secure to itself the benefit of the through trade. The through passenger business by the new route is transacted by the North Pennsylvania. The Reading Managers have for years past been contemplating the through Western trade by the Erie route, and now that that is available at last, they are not disposed to lose any time in securing it, being satisfied that the coal trade alone cannot be permanently relied on to pay a profit in so great an investment. It is probable that in time grain elevators and storage warehouses, both for provisions and breadstuffs, will be erected at Richmond and Willow Streets, and that the Reading Company will renew its application to Councils for permission to extend its tracks, and run its trains along Delaware Avenue from Richmond to Willow Streets.

ASSESSMENTS AND DIVIDENDS.

WE compile, principally from the San Francisco *Stock Report*, the following list, showing the total amount of assessments levied and the aggregate dividend disbursements of those companies in active operation, up to the close of the first half of the present year:

Name of Mine.	No. of feet on vein.	Total No. of Shares.	Assessments. No. of.	Total sum levied.	Date of last assessment.	Dividends. No. of	Total sum disbursed.	Date of last payment.
California Mines.								
Mansfield	3,300	66,000	5	$89,100	May 19, '76	..	....	....
New Coso	....	100,000	3	150,000	May 9, '76	..	....	....
St. Patrick	1,800	2 ,000	11	1 0,000	Aug. 12, '75	1	$60,000	Mch. 10, '76
Washoe Mines.								
Amazon Consolidated	1,500	60,000	2	21,900	Feb. 24, '76	..	....	....
Alta	600	108,000	3	75,600	Jan. 27, '76	..	....	....
Baltimore Consol	1,050	84,00	11	657,000	Mch. 23, '76	..	....	....
Best & Belcher	1,040	104,000	21	660,400	April 14, '71	38	15,397,200	April 10, '76
Buckeye	3,000	48, 00	17	284,0.0	May 19, '76	..	....	....
Caledonia	2,188	100,000	17	1,110,000	April 15, '76	..	....	....
California	....	....	..	....	....	2	2,160,000	June 15, '76
Chollar Potosi	1,40	28, 00	10	1,382,000	June 26, '76	44	3,080,000	Feb. 10, '72
Columbia	1,200	100,000	1	25,000	April 13, '76	..	....	....
Consolidated Virginia	710	540,000	15	411,200	June 11, '73	26	19,440,000	June 12, '76
Cosmopolitan	1,80	10 ,000	3	75,000	May 1, '76	..	....	....
Crown Point	541	100,000	20	973,370	Jan. 13, '76	50	11,588,000	Jan. 12, '75
Daney	2,000	108 000	1	16,200	May 15, '76	2	56,000	July 1, '73
Dardanelles	1,200	60,000	3	180,000	Jan. 12, '76	..	....	....
Europa	1,00	1 ,000	6	110,000	June 19, '76	..	....	....
Florida	1,200	20,00	5	175,000	" " "	..	....	....
Glasgow	1,500	60,000	2	21,0 0	Feb. 24, '76	..	....	....
Globe Consolidated	4,30	38,000	6	199,500	April 29, '76	..	....	....
Gould & Curry	612	108,000	26	1,910,000	May 18, '76	3	3,826,800	Oct. 10, '76
Green	1,634	20,000	13	10,000	Jan. 3, '76	..	....	....
Hale & Norcross	400	112,000	50	2,018,000	May 16, 276	36	1,598,900	April 10, '71
Jacob Little Consol	3,280	100,000	2	60,000	Feb. 14, '76	..	....	....
Justice	2,100	105,000	18	977,50.	Mch. 3, '76	..	....	....
Knickerbocker	1,20	1 0, 00	15	396,020	Mch. 31, '76	..	....	....
Kossuth	2,700	108,00	6	351,000	May 29, '76	..	....	....
Lady Bryan	5,000	100,00	12	625,00	May 26, '76	..	....	....
Lady Washington	1,200	60,000	7	198,000	Jan. 27, '76	..	....	....
Leviathan	2,000	1 0,000	3	150,000	May 19, '76	..	....	....
Mint	1,200	10,000	13	90,00	April 21, '76	..	....	....
Nevada	1,200	40,000	2	14,00	Mch. 30, '76	..	....	....
New York	1,000	100,000	9	570,000	Mch. 28, '76	..	....	....
Niagara	1 00	60,000	2	39,000	Jan. 12, '76	..	....	....
North Carson	1,500	100,0 0	4	7 0,00	April 2 , '76	..	....	....
New Cons. Virginia	1,500	100,000	3	100,000	June 3, '76	..	....	....
Original Gold Hill	3,000	30,000	5	82,50	Feb. 12, '76	..	....	....
Overman	1,200	38,00	35	1,107,080	June 26, '76	..	....	....
Phil Sheridan	1,2 0	24,000	4	60,000	May 6, '76	..	....	....
Pict n	2,000	30,000	1	73,200	May 24, '76	..	....	....
Prospect	1,000	100,00	1	100,000	April 24, '76	..	....	....
Rock Island	1,200	10 ,000	11	330,000	June 26, '76	..	....	....
Savage	771	117,00	24	2,746,000	May 31, '76	52	4,160,000	June 11, '69
Segregated Belcher	160	6,400	15	244,800	April 11, '76	..	....	....
Senator	1,200	24,000	13	111,600	Feb. 29, '76	..	....	....
Segregated Gold Hill	1,000	60,000	1	12,00	Jan. 12, '76	..	....	....
South Comstock	1,636	40, 00	4	44,000	May 3, '76	..	....	....
Sierra Nevada	3,300	100,000	44	1,300,000	May 23, '76	11	102,500	Jan. 16, '71
Succor M. & M. Co	3,800	68,400	14	10 ,700	April 17, '76	2	22,800	Oct. 16, '71
Trojan	1,800	100,00	2	80,000	June 14, '76	..	....	....
Union Consolidated	600	1 0,000	9	260,000	Mch. 3, '76	..	....	....
Utah	1,000	20, 00	12	340,000	Feb. 18, '76	..	....	....
Wells, Fargo	1,500	108,000	4	49,400	Jan. 28, '76	..	....	....
Woodville	1,700	120,000	13	801,000	Jan. 2 , '76	..	....	....
Yellow Jacket	957	120,000	22	2,478,000	Mch. 18, '76	25	2,184,000	Aug. 10, '71
White Pine Mines.								
Geneva Consolidated	3,000	50,000	7	82,500	Mch. 4, '76	..	....	....
Idaho Mines.								
Empire	....	25,000	12	307,500	Jan. 5, '76	..	....	....
Golden Chariot	1,82	90,000	16	622,500	Feb. 19, '76	13	500,000	Oct. 24, '73
Ida Ellmore	....	30,000	20	7 0,000	June 26, '76	6	60,000	Feb. 8, '70
Pauper	1,60	50,000	7	35,000	Feb. 26, '76	..	....	....
Thorman	....	50,000	6	175,000	May 19, '76	..	....	....
South Chariot	600	50,000	17	377,500	May 26, '76	..	....	....
War Eagle	1,000	20,000	11	130,000	Feb. 4, '76	..	....	....
Cornucopia District.								
Cornucopia Consol	3,000	100,000	1	10,000	Mch. 14, '76	..	....	....
Hussey	4,500	100,000	1	13,000	Apr. 15, '76	..	....	....
Leopard	1,500	50,000	1	50,000	Mch. 31, '76	3	87,50.	Feb. 15, '76
Beaver	1,500	52,000	1	5,000	May 20, '76	..	....	....
Ely District.								
American Flag	....	40,000	8	280,000	Jan. 17, '76	..	....	....
Alps	800	30,000	8	105,000	Feb. 10, '73	3	37,500	April 15, '76
Huhn & Hunt	3,600	30,000	12	306,000	Mch. 9, '76	..	....	....
Meadow Valley	....	60,000	11	33 ,0 0	Apr. 26, '76	17	1,260,000	June 16, '73
Pioche	1,000	20,000	13	250,000	Jan. 19, '76	3	60,000	Aug. 5, '72
Silver West Consol	...	50,000	6	47,500	May 24, '76	..	....	....
Miscellaneous.								
Adams Hill	....	5 ,000	7	60,500	May 2, '76	..	....	....
Belmont	....	50,000	8	350,000	Mch. 28, '76	..	....	....
Cherry Creek	1,000	30, 00	1	90,000	June 27, '76	..	....	....
Coso Consolidated	4,502	100,000	1	30,000	Mch 8, '76	..	....	....
Eureka Consolidated	....	50,00	5	120,000	May 26, '76	2	1,000,000	Aug. 5, '75
El Dorado South Con	2,600	40,00	6	437,500	Mch. 23, '76	..	....	....
General Thomas	2,100	50,00	1	25,000	May 10, '76	..	....	....
Jefferson	8,182	50,0 0	1	37,500	May 5, '76	2	50,000	May 15, '75
Jackson	....	30,000	5	127,500	Feb. 25, '76	..	....	....
Juniata Consolidated	5,000	5 ,000	4	107,5 0	Jan. 27, '76	..	....	....
Northern Belle	1,600	50,000	..	....	....	13	65 ,000	June 15, '76
Prussian	1,000	30,000	1	142,500	Mch 14, '76	..	....	....
Webfoot	3,800	50, 00	2	35,000	Apr. 14, '76	..	....	....
Total				$31,228,950			$67,680,300	

The above figures indicate an excess of $36,451,650 dividends over assessments. Of this amount $46,425,200, or over two-thirds of the whole, was paid out by three companies, viz.: The Consolidated Virginia, Belcher and Crown Point.

The past six months has witnessed an unusual impetus in the development of our Western mines owing largely to the rich discoveries in the Comstock lode, and partly to rich discoveries in other fields. The assessments for this period therefore have been unusually large, much of the capital thus raised has been invested in heavy machinery for the deep Comstock mining, and for their extensive works.

THE SALT LAKE CITY SILVER ORE MARKET.

Mr. J. B. MEADER, assayer, gives the following statement of the ore and metal market for the week ending July 15 :

Argentiferous Lead (Base Bullion).—$80 per ton for lead; $1.06 per oz. for silver ; $20 per oz. for gold. The above quotation for silver is based upon a silver contents in the lead of 80 to 100 oz. per ton of 2,000 lb.

Argentiferous Lead Ores.—From 90c. to $1.00 per oz. for the silver contained therein based upon a standard of 40 per cent. lead, each unit above 40 per cent. 50 cents per unit added. Each unit below 40 per cent. 50 cents deducted. Extreme prices, and only for most desirable carbonate ores, free from zinc, copper, and antimony. Ores containing zinc—For each unit of zinc above 5 per cent., deduct the value of 1 oz. of silver. Ores with a lime or ferruginous gangue subject to higher rates. Copper in all the above ores objectionable.

Copper Ores.—Assaying 20 per cent. net assay, $1.40 per unit (or per cent.) ; assaying 25 per cent. net assay, $1.70 per unit (per cent.) ; assaying 30 per cent. net assay $1.92 per unit (per cent.) ; assaying 35 per cent. net assay, $2.30 per unit (per cent); assaying 40 per cent. net assay, $2.25 per unit (per cent.) ; assaying 45 per cent. net assay, $2.35 per unit (per cent.) ; assaying 50 per cent. net assay, $2.45 per unit (per cent.) per ton of 2,000 lb. To obtain the net assay, 1 and 3-10 per cent. is deducted from the wet assay. Silver has improved somewhat during the week, yet it is by no means settled that it will not still further decline; therefore buyers are slow to take up engagements for the future, and are only purchasing from day to day ; this makes the market unsettled and panical

Shipments of base bullion for the month of June	4,002 468 lb.
" " " 5 months of 1876	14,485,298 "
Total for six months	18 487,766
Ore shipments for six months reduced to lead	1,263,429
Total production of lead	19,751,195

RENO (NEVADA) RATES,

For the payment of silver ores are as follows :

Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.	Assay Value.	Per Cent.
$40	25	$57	35	$88	45	$129	55	$200	65	$350	75
42	26	58	36	90	46	133	56	210	66	375	76
44	27	59	37	93	47	137	57	220	67	400	77
46	28	60	38	95	48	142	58	230	68	450	78
48	29	66	39	98	49	146	59	240	69	500	79
50	30	70	40	100	50	150	60	250	70	600	80
52	31	73	41	107	51	158	61	263	71	700	81
54	32	76	42	112	52	166	62	275	72	800	82
55	33	80	43	119	53	175	63	288	73	1,000	83
56	34	84	44	125	54	188	64	300	74		

The above are the standard rates, and are used as a basis from which the prices of silver ores throughout the West are calculated

MINING NOTES FROM CALIFORNIA, IDAHO, AND MISSOURI.

CALIFORNIA.—The *Dutch Flat Forum* of the 13th inst. says with regard to the Hydraulic Mines in that district: The *Pacific, Central, Elmore Hill, Dunning, Polar Star, Boston, Franklin, Lakamp* and *Summerset* claims are all being energetically worked and are pressing forward for the prize of the larger profits which can be realized in warm weather; in the cold and frosty days of Winter, the mercury congeals and refuses to amalgamate with the gold.

This is the harvest time with the hydraulic miner and lucky is he who has sufficient water to run through the Summer.

The Cedar Creek Mining Company, is drawing on its reservoirs to keep up the supply of water and in a few days we may expect that the Yuba will be so low that the Miner's ditch will be empty.

The South Yuba Canal Company, having their immense reservoirs, can run later. It is a question, however, this season, whether it can make up for lost time, the ditch last Winter was broken about two months in all, so that in order to keep even with the Cedar Creek Company, as regards time, it is necessary that it should run water about seven weeks later, as there appears to be a rivalry on this question this is worth noting.

The Yankee Tunnel is being driven with vigor. It was advanced 130 feet last month at a cost of $2,398, being an average of $18.45 per foot. The size of this tunnel is 8x9 feet. It is now into the hill, 1,400 feet. At the present rate of speed the Superintendent will have no difficulty whatever in carrying out his plan of reaching, and washing through the Baker shaft next season.

IDAHO.—The *Silver City Avalanche* of July 1st says : *The Poorman Mine.*—The developments of this mine continue to be of the most cheering and encouraging character. Superintendent BLEDSOE is working his limited force to the very best advantage, and there is now no doubt of the fact that they have approached a well-defined ore body which will turn out to be as rich and productive as that which made the Poorman the pride and glory of War Eagle Mountain some ten years ago. We saw some rock this week that came from the winze in the seventh level, 500 feet north of the shaft, and also some from a point directly under the spot where much of the rich ore was taken when the Poorman did its former flourishing business. It is unmistakably rich in black sulphurets of silver, and much of it is well lined with streaks of gold. If the Poorman had been judiciously worked in the past, there is no doubt that this rich ore body would have been discovered many long months ago. It is not too late, however, to make it available. Let the Poorman be worked honestly and on its merits, and we believe its bullion products will astonish and gratify every man directly, or indirectly, interested in the success of the mine.

The Potosi Mine.—Recent developments in this mine are most promising and satisfactory. At a distance of 280 feet in the tunnel, the ledge is about 30 inches wide at the bottom and from 15 to 18 inches at the top. There has been good milling ore all along the tunnel, and it greatly improves in quality as the work progresses, coming up fully to the expectations of Mr. PECK, the owner of the mine, who pronounces it the finest and most promising ledge in the camp. The rock shows up in pyrites of copper and iron with abundance of silver and considerable gold. A connection will soon be made with the shaft, when the ore will be taken out at the rate of 20 tons per day.

The Golden Chariot Mine.—The encroachments of the water in this mine are being successfully fought. The great heat of last week, and the consequent snow melt, caused a flood in the lowest levels. A syphon 800 feet in length, which raises the water nearly 14 feet, was put in from the 8th level bulkhead and run over into the Minnesota, which divides the force of water between the two works. Superintendent BALDWIN states that the water will be driven from the mine within five days, and the men will be at work as usual on the 12th and 13th levels. There is a large amount of bullion ready for shipment, and when the floods have subsided every department of work will be resumed as usual.

MISSOURI.—*Granby Miner.*—*The Dayton Lead Mines* are beginning to show evidences of becoming a point of more than ordinary interest. These mines are situated in Newton County, two and a half miles north-west of the town of Dayton. A steam pump is now in operation, and it is the intention of the proprietors to furnish the miners with pumps sufficient to control the water and insure the profitable working of the ground. Already upward of fifty miners are at work with fair prospects, and some seven or eight shafts are paying handsomely. The new smelting works will soon be completed. About 35 000 pounds of mineral are now stored in the bin. None of the shafts have been sunk more than thirty feet, and mineral is found from the grass roots down. The ground is easily worked and but little blasting is necessary. A number of experienced miners have visited these diggings and returned convinced that they will pay.

NOTES.

THE SILVER MINE AT NORTH OXFORD, MASS., is being worked by a Providence company.

THE NICKEL MINE OF MR. SEALS, near Pottersville, N. J., is said to be developing finely, and now shows a splendid vein three feet wide.

THE RUSSELL (North Carolina) GOLD MINE has been transferred to an English company, who intend to construct a 60-stamp quartz mill, with the design of treating low grade ores cheaply, but on an extensive scale.

THE NEW GLASGOW COPPER MINING COMPANY, prospecting near Lochabar Lake, Antigonish County, N. S., struck what is familiarly known as the "big boulder" lead, recently. It shows rich ore, and is about six feet thick. This makes the fourth lead now opened on this property, all within a few feet of each other. This promises to be one of the most valuable discoveries in mining properties in our province.—*Halifax Chronicle*, June 29th.

THE KING'S MOUNTAIN GOLD MINE, that has never until recently earned a profit, is now running 20 stamps, and obtaining a monthly yield of $3,000. The company has 20 additional stamps that will find employment as soon as the hoisting facilities can be completed, the body of ore in sight being sufficient for the purpose. The fact that our own people are so strongly prejudiced against mining affords our foreign friends a free field in all parts of our country east of Nevada, and they give a preference to North Carolina because of the abundance of the ores, the low rate of wages, the general cheapness of living, and the uniform mildness of climate that permits the uninterrupted prosecution of work throughout the year.

PROPOSED CONTINUATION OF THE EXPERIMENTS OF THE LATE PROF. WALT. R JOHNSON ON AMERICAN COALS.—The National Academy of Science has prepared a memorial to Congress asking for a continuation of these extremely valuable experiments, to be extended to the coals of the Mississippi, and those of the elevated country beyond, to the Pacific Coast. The principal plea of this memorial is in behalf of the national protection, and the demands of the United States Army and Navy; but the secondary one, in the interest of manufactures and commerce, would present a much stronger claim upon the government. Fuel is the primary necessity of modern civilization—the basis of modern industry, and the development of the resources of the country by investigation, under national direction and authority, is an unquestionable duty of Congress. No one of the numerous publications in the way of statistics ever made by the authority of the United States has had a larger quotation, or been more practically useful in the arts and sciences, than this original report of Prof. JOHNSON, and an equally well considered document which should embrace the *fuel*, and the *fuel* resources of this country would be appreciated in all lands. It is to be trusted that this recommendation of the academy will be liberally responded to.—*Franklin Institute Journal.*

EARNINGS OF BOATMEN AND MINERS IN THE CUMBERLAND COAL FIELDS FOR SEVERAL YEARS.—It is a noteworthy fact that for quite a number of years past there has been no class of men connected directly with our coal traffic who have suffered so many embarrassments by frequent changes in their income from freights and business affairs on the canals as the boatmen. All the disturbing elements of the trade seem to have made a drive at them ; and upon them has fallen a large percentage of the reductions that have been made from time to time in carrying our coal to market. A brief sketch of the past ten years will bring this fact out very prominently. Prior to the war the lowest rate for freight per ton was $1.10, and the average amount paid was about $1.15 per ton. During the war they were paid a high price for carrying coal, because the personal danger to themselves was great, as was also the risk of the boat's being captured and burned by the Rebs and the stock carried off. In 1864 they received $3 a ton to Georgetown (very little coal was taken to Alexandria during the war). On the 5th of June, 1865, they were reduced to $2 a ton, and in the Spring of 1866, to $1.60. On the 18th of April, 1867, they began carrying coal to Georgetown at $1.40. On the 24th of the same month they were reduced to $1.30. This was received until August 4, 1868, when their earnings took an upward rise to $1.50. In the Spring of 1869, the ruling payments to Georgetown and Alexandria were $1.45 and $1.50 respectively, remaining in force until August 28, 1871, when they received $1.40 and $1.45, continuing until April 18, 1872, when the companies paid $1.35 and $1.40. On March 29, 1873, the charges advanced five cents a ton, and the amount paid was $1.40 and $1.45. This year will be remembered as one in which the figures were shifted a number of times; on April 28, they dropped to $1.35 and $1.40, and on July 29, they were reduced five cents. The last reduction brought a strike among the boatmen, which lasted one week and resulted in their carrying their point and securing an increase of five cents a ton The season closed with the companies paying $1.34 and $1 40, which price continued until June 2, 1874. At that time it was discovered that one of the companies, "nameless here forever more," was exacting a drawback of $10 a boatload from its men out of consideration for dispatch. The other companies refused to pay the old rates under such circumstances, and a strike among the boatmen ensued to prevent the boatmen of that company leaving with cargoes. This strike, accompanied by some violence, continued until August 18, the men then going to work at $1.20 and $1.25. The bonus matter again came to the front and on August 24, a strike occurred, the boatmen demanding $1.40 and $1.15. This continued until September 5th, at which time all the companies acceded to the trumpet-call of the boatmen.

During the Fall of 1874 the Boatmen's Union was formed, and disbanded, by the way, the next year. In the Spring of 1875 the Baltimore and Ohio Railroad Company made a reduction of twenty-five cents a ton on the price of carrying coal to the seaboard, which necessitated a reduction all around, the boatmen carrying coal for $1.25 and $1.30, and the Canal Company acquiring the wharves, with the discontinuance of wharf charges.

On July 13, it once more leaked out that a certain company was demanding a drawback of $10 a load from its men, the upshot of which was that freight went down to $1 20 and $1.25. On August 3 it dropped still lower, to $1.15 and $1.20, with "cut" rates as low as $1.10. The present Spring opened with $1 a ton to boatmen inscribed on the fair and blameless pennon of the Consolidation Company, and that account has been the prevailing rôle so far, though "cutters" have in some cases found some ill-starred boatman, who, with the specter of imminent starvation before him, could be induced to boat for ninety cents a ton. The wages paid the miners have not been subject to that fluctuation so noticeable in the earnings of the boatmen. During the war they received $1 a ton, and this was reduced at the close of the same to seventy-five cents. In 1866 the companies attempted to reduce them to fifty cents, and failed in so doing. A compromise was reached, however, placing the price of mining, per ton, at sixty-five cents, which amount is now given. The attempt of the companies to reduce, this Spring, to fifty-five cents, failed entirely, as our readers are well aware. The cost of digging coal before the war was thirty cents a ton.—*Columbian* (Md.) *Allegantan*, July 14, 1876.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending July 15.

Tons of 2,240 lb.	1876. Week.	1876. Year.*	1875. Week.	1875. Year.*
Wyoming Region.				
D. and H. Canal Co	50,815	971,072	61,730	1,712,249
D. L. and W. RR. Co.	39,200	690,712	71,344	1,651,771
Penn. Coal Co	28,695	477,023	20,508	688,945
L. V. RR. Co.	22,916	463,270	25,658	452,244
P. and N. Y. RR. Co.	—	12,649	3,018	62,069
C. RR. of N. J.	31,905	588,273	40,346	379,787
Penn. Canal	7,785	154,262	16,653	35,993
	181,316	3,357,261	257,347	4,984,159
Lehigh Region.				
L. V. RR. Co	82,858	1,178,280	65,295	313,464
C. RR. of N. J.	30,528	573,524	31,282	63,488
D. H. and W. B. RR.	2,129	20,616	1,557	36,023
	115,515	1,772,420	98,134	412,975
Schuylkill Region.				
P. and R. R. RR. Co.	141,122	2,050,218	170,611	1,171,823
Shamokin & Lykens Val.	18,914	416,555	33,556	608,010
	160,036	2,466,773	204,167	1,779,833
Sullivan Region.				
Sul. and Erie RR. Co.	10	26,409	—	5,557
Total	456,877	7,622,853	559,648	7,182,524
Increase	—	440,329	—	—
Decrease	102,771	—	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

Perth Amboy business:

	Tons.
Received for the week	23,098
Shipped for the week	19,126
On hand July 15	84,093

Freights to Boston, 90c.; Hartford, 90c.; New York, 35c.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 324,251 tons, as compared with the corresponding period in 1875.

Belvidere Delaware RR. report.	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	10,563	116,279	9,983
" " " South Amboy	9,886	218,504	31,430
Shipments at Coal Port (Trenton)	7,174	110,152	7,824
" South Amboy	9,209	224,657	103,607

Receipts of Coal at Boston, for week ending July 14, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	1,895	71,524	85,844
Philadelphia	10,036	550,886	374,155
Baltimore	1,010	124,966	146,558
Other places	4,290	258,762	212,971
Great Britain	—	4,620	2,224
Nova Scotia	1,118	18,489	22,371

Shipments of Coal from Richmond, from January 1, 1876, to July 15, 1876, inclusive:

	Week.	Year.
By Cannelton Coal Company	1,094	17,534
" Peytona " "	780	1,845
" Blacksburg " "	—	4,587
" Coal Valley " "	483	7,246
" Other " "	—	4,735
Total tons	2,357	42,947

Coal Shipped at Pictou, N. S., for week ending July 15 1876 ..... 5,109 tons.
Previously exported ..... 62,553 "
Total to date 67,662

The Production of Bituminous Coal for the week ending July 15, was as follows:

Tons of 2,000 lb., except where otherwise designated.	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb	46,453	865,250
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	6,874	173,719
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,262	84,565
*East Broad Top	663	37,529
Clearfield Region, Pa.		
*Snow Shoe	422	29,870
*Tyrone and Clearfield	11,798	590,491
Allegheny Region, Pa.		
*Pennsylvania RR	3,411	110,112
Pittsburgh Region, Pa.		
*West Penn. RR	2,063	104,938
*Southwest Penn. RR	948	31,259
*Penn. & Westmoreland gas coal, Pa. RR.	11,723	396,717
*Pennsylvania RR	1,403	157,999

* For the week ending July 7.

The Production of Coke for the week ending July 7.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
West Penn. RR	528	24,455
Southwest Penn. RR	8,665	257,527
Penn. & Westmoreland Region, Penn. RR.	1,154	23,758
Pittsburgh, Penn. RR.	1,506	99,474
Total	11,853	405,214

COAL TRADE REVIEW.

NEW YORK, FRIDAY EVENING, July 21, 1876.

Anthracite.

The old story of no business reported by some, and improving transactions quoted by others, has become monotonous. The fact is the temperature during the last three weeks has been so excessively high, that human nature revolts at encouraging the production of heat giving substances, especially when they are fuels possessing so high a calorific power as Pennsylvania anthracite. To this must be attributed the general dullness in the coal trade, and the indifference which is shown by consumers to the decrees increasing the price of anthracite.

The announcement of an advance of 15 cents per ton for August has brought out a few buyers and perhaps a few more will follow next week; after which, business will probably settle down to as great quietness as has ruled this year. It is quite evident that advancing the price of coal in such times as these is not the way to encourage trade. Manufacturers who have already found the cost of production so high, that many of them are running their mills at a loss, are not likely to purchase a great amount of fuel at an advance even though there be a prospect of a further and much greater one. We do not contend that a reduction in the price of coal would immediately create a great revival in this business, but we do contend that cheap fuel is quite essential to the establishment of a foundation for a revival. The reduction in the price of coal not only shows a saving to the manufacturer in his fuel account, but also in nearly every article that is used or consumed in a manufacturing business; so that the advantages of cheap fuel are much greater than generally admitted, they are in fact incalculable. We are aware that a large proportion of the coal producers realize this fact, but there is a disinclination on their part to alter the programme as laid down for this year's business. There are many, however, who continue to meet the situation so far as it is in their power, by selling such coal as they are permitted to mine, at prices very much under circular rates.

The production last week was 456,877 tons as against 559,648 tons for the corresponding week of 1875, showing a loss for the week this year of 102,771 tons. This leaves the shipments from January 1st, as compared with the corresponding period of last year, but 440,329 tons in excess. As work at the mines is largely suspended this week, the next report will show but a very small excess, which will be almost, if not entirely, balanced by the first of August. In last week's production the Lehigh Valley Railroad Company figures to the extent of over 23 per cent., while from January 1st its percentage has been 21.

IMPORTANT ACTION OF THE COMBINATION.—At a meeting of the Combination held in Pennsylvania last week, it was resolved, in substance, that, whereas the Lehigh Valley Railroad Company had up to July 1, exceeded its proportion of shipments to tide-water by 80,000 tons, unless this excess be extinguished before the end of August, the several companies in the Combination shall then be relieved from all further obligation to observe the terms of the programme. This very important action has been supplemented by the call for a meeting of the Lehigh coal operators at Mauch Chunk to-day, the result of this has not been reported up to the time of our going to press, but, judging from the past and from a knowledge of the views of several of the more influential operators, it is safe to assume that some measure promising a compliance with the requests of the Combination will be adopted, and the usual announcement that everything is harmonious in the councils of the Combination will be made.

That the Combination will be dissolved does not appear probable. It has proved of incalculable advantage to the coal producers generally, and as we have frequently shown, has regulated prices and the trade with moderation and justice, albeit with a somewhat too sanguine view of the financial condition of the country. None of the companies can afford to enter into open war, and this very weakness is the strongest ground for believing in the continuance of a compact that all admit has in the past stood between the producers and carriers of the coal trade and financial ruin. At the same time, there must clearly be an honest compliance with the spirit of the programme by each of the parties to it, if it is to be considered as binding on any, and there is no concealing the fact that at present it is disregarded either as to production or prices, by more than one of the companies.

We have good reason to believe a very considerable reduction in the price of furnace coal at Mauch Chunk will take place before the close of the season if indeed it has not already been made in some case—$2 and $2.25 per ton are named as probable figures. From all these indications it seems the absolute necessity of the iron trade is at least being recognized, and this recognition comes none too soon, for the lower prices of fuel, and nearer markets for iron at the Western works is building up a rival that threatens to destroy the Eastern iron trade unless speedy relief come in the shape of lower transportation charges and cheaper "stock." Wages at the mines will also be, unquestionably, largely reduced before another season's work commences. It behoves those interested to make note of these signs and govern themselves accordingly.

Bituminous.

There are no new features in this trade, and no business of importance to note. The low rates of freight from Philadelphia and this port have had the effect of attracting a good supply of vessels to Georgetown, and the increased business from that port, which we noticed in our last, continues. With the present rates of freight, bituminous coals can be shipped from Philadelphia and delivered at Boston for $4.60@4.80 per ton, and from Georgetown at $4 90@5.10, while if circular prices for anthracite were maintained, chestnut coal would cost $5.75, delivered, and lump, $5.65, and other sizes still more.

The shipments of Cumberland coal show a falling off last week, as compared with the corresponding week of last year, of 12,971 tons, making a total decrease since January 1, as compared with the like period of 1875, of 324,251 tons. Our latest report from the Clearfield region is for the first seven days of this month, and owing to the large observance of the national holidays, the shipments were not one-half the usual proportions.

GAS COAL.—We note sales aggregating about 3,000 tons of Cannelton caking coal for gas purposes. This coal has already been used with good results in gas making, and will, undoubtedly, establish a commanding position in the trade at an early day.

In Provincial coals there is very little doing, so little, in fact, that we hear of some of the mines being temporarily closed. Some of these coals have been offered, delivered in this market, at $4.12½, currency, without drawing out orders of any moment, while our Pennsylvania gas coals are quoted at $6. It is quite evident, therefore, that even were the duty (75c., gold, per ton) removed, the Provincial coals would never become formidable rivals to our American gas coals, whether of Pennsylvania or West Virginia origin.

* ***Wholesale Prices of Anthracite Coal for July, f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.***

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Weehawken	4 75	4 85	4 95	5 05	5 65	4 95
Pittston at Newburg	4 60	4 70	4 80	4 90	5 50	4 80
Wilkesbarre at Port Johnston	4 75	4 85	4 95	5 05	5 65	4 85
Plymouth, R. A.	....	....	4 95	5 15	5 75	4 95
Susque. Coal Co. at Amboy W.A.	4 75	4 85	4 95	5 15	5 65	4 95
Kingston at Hoboken	4 75	4 85	4 95	5 15	5 65	4 95
Lehigh Coals.						
Old Company at Port Johnston	5*25	....	5 05	5 05	5 65	4 95
Old Company's Room Run "	5 25	....	5 05	5 05	5 65	4 95
Sugar Loaf, Hobok. & Amb. "	5 25	....	5 05	5 05	5 65	4 95
Lehigh Coal Exchange "	5 25	....	5 05	5 05	5 65	4 95
Honey Brook Lehigh	5 25	....	5 05	5 05	5 65	4 95
Beaver Meadow at South Amboy	5 25	....	5 05	5 05	5 65	4 95
Schuylkill Coals at North 9th st., Brooklyn, E. D.†						
Schuylkill white ash	4 75	4 85	4 95	5 05	5 65	4 85
Schuylkill red ash	....	....	....	5 15	5 75	4 85
Shamokin white and red ash	....	....	....	5 25	5 75	4 85
Lorberry	....	....	5 85	5 85	5 85	4 90
Lykens Valley	....	....	6 30	6 30	6 30	5 35

* Contractor's prices are 20c. per ton less.

†The prices of Schuylkill coals for shipment from Philadelphia are 35c. per ton less than at Brooklyn.

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. York	40c.
" " South Amboy to New York	30@35c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, Rondout, South Amboy and Perth Amboy to New York City and vicinity 50c

Freight by the Pennsylvania Coal Company's boats from Newburg to New York 65c.

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 70	$6 00	$5 30
Lackawanna coal, in yard	5 70	6 00	5 30
Wilkes-Barre, delivered	6 25	6 75	5 75
Lehigh & Locust Mountain, del'd	7 00	7 00	6 00
Schuylkill Red Ash, del'd	7 50	7 50	6 00

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	22 00
American " " " "	13 00
Cannelton splint, " " "	8 00
Cannelton Block, " " "	8 00
American Orrel " " "	11@14
Red Bank Cannel " " "	14 00
Cumberland " " "	7 00

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	....
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	4 25	5 75
Despard, West Va	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	6 00
Fairmount, West Va., " "	4 35	6 00
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va	....	10 00
" Splint, " at Richmond.	4 50	6 00
" Gas Coal at Richmond.	4 00	5 50
Peytona Cannel, W. Va at Richmond	8 50	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	3 50@3 75	4 90
Cumberland, at Baltimore	3 65@3 80	5 10
Clearfield f.o.b. Canton, Baltimore	3 75@....	5 25

Rockhill Semi-Bituminous and Broad Top, at the mine, per 2,000 lb., 95, f. o. b. Greenwich, Philadelphia, per 2240 lb., $3 60@3 95, according to destination; at South Amboy, N.J., 4 60; New York, 5 00.

Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, per 2000 lb., 95; at Greenwich, Phil., per 2240 lb., 3 75@4 25, according to destination; f.o.b. South Amboy, N. J., 4 75; New York, 5 25.

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S	2 00	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou	2 25	5 75

Baltimore, Md. July 20, 1876.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 72	$4 57
Broken	5 10	4 93
Egg	5 20	5 05
Stove	5 61	5 46
Nut	4 76	4 61
Shamokin. (red or white ash), and "Boston," free burning white ash,		
Egg	5 30	5 10
Stove	5 60	5 40
Lykens Valley, red ash,		
Egg and stove	6 15	5 78

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. $9 35@8 00

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point	3 80@4 00
West Virginia Gas f. o. b. at Locust Point	....
Youghiogheny Gas, f. o. b. at Locust Point	....

Boston. July 15, 1876.

Coal is having a few odd inquiries for small cargoes of both bituminous and anthracite. The drying up of the small rivulets has shortened the water materially at all points, and a very general recourse to steam is imminent. The heavy storms of Sunday and Tuesday have temporarily bridged over the anxiety of a number, but without a heavy rain storm over eastern New England for the next fi days, a sharp demand would almost immediately clean out the pockets here, at Salem, New Bedford, and Providence. There is no snap to the petty business that is doing, prices rule low and irregular, hence the buyers who would bid generously are intimidated. Freights are unchanged.—*Commercial Bulletin.*

Cleveland, O. July 20, 1876.

Specially reported by Messrs. BATES & MARTIN.

Herewith find quotations of our market:

Per ton of 2000 lb. f. o. b. vessels.

WHOLESALE.

	For vessels.	On cars.
Youghiogheny Gas Coal	$4 10	$4 00
Cannel	4 25	4 15
Blossburgh	$5 00	$5 00
Briar Hill, Block Coal	3 50	3 25
Straitsville Coal Co., lower vein	3 00	2 90
" " " whole "	2 90	2 80
Hocking Valley	2 90	2 90
Massillon	3 00	3 00
Tuscarawas Valley	2 65	2 60
Columbiana	2 65	2 60

Office of CLEVELAND COAL EXCHANGE,
89 Seneca Street, June 3d, 1876.

PRICES TILL FURTHER NOTICE.

	1 to 10 tons.	10 tons upw'd.
Massillon, Brier Hill and Mineral Ridge, lump.	$4 50	$4 25
" " " " " nut	4 00	3 75
Straitsville Lower Vein, Hocking & Shawnee, l'p.	4 00	3 75
" " " " nut	3 50	3 25
Del Carbo and Rich Hill, lump	3 75	3 50
" " " " nut	3 25	3 00
Maple Hill, lump	3 50	3 25
" " nut	3 25	3 00
Columbiana, lump	3 25	3 00
" nut	2 75	2 50
Lackawanna and Wilkesbarre, egg and grate	7 50	7 30
" " stove	8 00	7 75
" " chestnut	7 75	7 50

No Anthracite coal to be sold for future delivery except it be subject to Exchange price at time of delivery.

H. E. CHUBB, Secretary.

Chicago, Ill. July 18, 1876.

Prices remain unchanged.

Cincinnati, O. July 20, 1876.

Reported by our Special Correspondent.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½@8c.	—
Pomeroy coal "	5 @6c.	—
Kanawha " "	7 c.	—
Cannel coal, according to quality "	11 @16c.	—
The following are the retail prices delivered		
Youghiogheny	10c.	—
Pomeroy	9c.	—
Cannel	14@22c.	—
Kanawha Semi-Cannel	10c.	—
Anthracite, per ton	10 50@11 00	—
Coke, at yard	7c.	—
Coke, hard and soft, delivered	9@10c.	—

Erie, Pa. July 20, 1876.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. July 20, 1876.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

White River, per ton	$2 50	Peytona cannel, per ton.	5 75
Brazil Block, "	2 50	Indiana Cannel	4 50
Highland, grate, "	2 25	Hocking Valley	4 25
Block coal, nut, per car	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 35	Nut	8 50
Egg	8 35	Stove	8 75

Lehigh Anthracite.

Broken	9 75	Nut	9 50
Egg	9 75	Stove	10 00

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	13	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	13	Virginia "	27
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$9 75 per ton.
Lehigh, retail	$11 50 per ton.

Louisville, Ky. July 20, 1876.

Specially reported by Messrs. BYRNE & SPEED.

Please report our prices as follows:

WHOLESALE.

	per bushel		per bushel
Pittsburgh	12c.	Pine Hill	—
Raymond City	9c.	Kentucky	8c.

RETAIL.

	per bushel		per bushel
Pittsburgh	12c.	Peytona Cannel	20@22c.
Raymond City	11c.	Buckeye "	20c.
Pine Hill	13c.	City-made Coke	10c.
Kentucky	10c.	Anth., per ton, $10 00 to 10 50	
Screened Pittsburgh per load		$3 00	
Screened Raymond City		2 75	
Pine Hill (Kentucky)		2 75	
Cannel		$5 to 5 50	

Milwaukee, Wis. July 20, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	7 00

New Orleans, La. July 15, 1876.

Reported by C. A. MILTEBERGER & Co.

We quote:

Pittsburgh coal, retail, per bbl	....
" wholesale	30c.
" steamboats, per box	40c.
" to manufacturers, per bbl	45c.
" shipments, per hhd	$5 25
Anthracite, wholesale, per ton	....
" retail, "	12 00
Virginia Cannel, per bbl	80c.
Scotch " "	80c.
Mt. Carbon, wholesale, per bbl	....
" " retail, "	50c.
St. Bernard wholesale, per bbl	30c.
" retail, "	50c.

Richmond, Va. July 17, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Prices are now as follows:

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 00
" semi-Cannel	4 00	Clover Hill Coal	3 50
Coalburgh Splint	4 00	James River Bitum	3 30
Lewiston "	4 00	" " Carbonite,	5 00
Kanawha Gas coal	3 90		

San Francisco, Cal.

From the *Commercial Herald*, July 13, 1876.

Imports from Jan. 1st to July 1st:

	tons.		tons.
Anthracite	7,622	Vancouver Island	51,531
Australian	37,294	Rocky Mountain	132
Coos Bay	19,949	Seattle	49,859
Cumberland	3,599	Bellingham Bay	11,320
English	10,831	Chili	2,076
Mt. Diablo	54,601		

Pacific Coast supplies continue to come forward in considerable quantities, including imports from British Columbia. The market, for reasons before given, favors the buyer. The product of the Seattle mines is notably large. Imports from New South Wales for six months past show a very considerable falling off as compared with same period in 1875. The product of the Victoria (B. C.) mines has largely increased during the year, particularly from the Wellington Mine. The Seattle Mine is under contract to furnish the Central Pacific Railroad large supplies, and the Nanaimo mine is now seeking to supply the Pacific Mail Company with its superior steam product at $8@9, taking the place of Wellington, which for a year past has been furnished the Pacific Mail Company at $12. Imports for July embrace the following cargoes: *Sonoma* (Wellington), 1,650 tons; *Blue Jacket* (Nanaimo), 1,860 tons; *California* (Seattle), 1,515 tons; *Lizzie Williams*, do, 1,300 tons; *Europa* (Newcastle, N.S.W.), 576 tons; *Alaska* (Coos Bay), 250 tons; *Theo. Koener* (Nanaimo), 1,600 tons; *Lookout* (Bellingham Bay), 1,250 tons; *British Duke* (Sydney), 1,967 tons; *Johan Irgens* (Nanaimo), 1,200 tons; *Deux Amis* (Wellington), 617 tons; *Great Admiral* (New York), 300 tons; bark *Wigton* (Glasgow), 1,190 tons; etc. The few cargo sales making nowadays are generally *sub r. sa*, making it very difficult to give the true price or actual quotations. As before published, English steam cargoes to arrive next Autumn have been sold as low as $7@7.50. California (Mt. Diablo), is held at $5.75 for screenings, $7.75 for coarse; Australian, $9@9.50, latter for Wallsend; Coos Bay, Vancouver, Bellingham Bay, Seattle, etc., $9; Anthracite, $12@14; Cumberland, $14@16—all for spot parcels. We note the following arrivals at the close; *Commonwealth*, 1,840 tons Newcastle N. S. W.; *Brierly Hill*, 730 tons from Nanaimo B. C.; *W. H. Dietz*, 850 tons Seattle; *Empire*, 500 tons Coos Bay; *Della*, from Newcastle, N. S. W., with 715 tons.

Montreal. July 17, 1876.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

Scotch Steam	$4 60	Cape Breton Steam	$4 00
Pictou "	4 50	Newcastle Smiths,	5 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$6 70	Chestnut	6 40
Stove	7 15		

Toronto, Ont. July 17, 1876.

Chestnut	$7 25
Stove	7 50
Egg and grate	7 25
Bituminous coal for domestic use	6 00
" " steam	3 50@5 50
Lehigh Lump and broken	7 50
Blossburgh	6 30

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals, per ton of 2240 lb.	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	2 36	2 22	2 78	2 69	2 92
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	70
‡ Phillipsburg, N. J., (46 miles)	89	75	1 31	1 22	1 45
Elizabethp't, (114 m) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	2 00	1 86	2 42	2 33	2 56
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	2 36	2 22	2 69	2 69	2 92
Jersey City, N. J., (121 miles) and New York, via L. V. RR.	2 30	2 16	2 63	2 63	2 86
Andover, via Delaware, Lackawanna and Western RR.	3 30	3 10	3 70	3 69	3 99
§ Trenton Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, (97 m.) for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $2 14

From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. and L. and S. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware. Lackawanna and Western RR., Morris and Essex Division 1 10

From *Lackawanna Junction* to **Auburn, N. Y.*, (191 m.) for shipment, via Southern Central R.R. in connection with Pa. and N. Y. R.R. 2 41

From *Lackawanna Junction* to ‖*Weedsport* (201 m.), for *Rochester and Charlotte and Erie Canal* 2 47

From *Lackawanna Junction* to *Sterling* for *Oswego, N. Y.*. 2 50

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 08

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

The distances in the above table are Computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles, and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Freights.

Representing the latest actual charters up to July 21, 1876.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	...	....	....	....
Albany	180	...	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	....	1 50	....	90
Bath, Me	1 45	1 40	1 40	90
Baltimore	....	....	....	....
Boston, Mass	1 15@1 30	1 40	145-50	90
Bridgeport, Ct	†1 00	1 35	....	55
Bristol, R. I	...	....	....	80
Cambridgeport, Mass.	§1 25@1 35	....	...	90
Derby	....	....	...	....
Dighton	....	....	....	....
East Cambridge	§1 25@1 35	....	....	190
Fall River	1 20@1 25	1 30	1 35	80
Hackensack	*70	....	....	....
Hallowell, Me	....	....	....	....
Hartford	*70	....	....	....
Hoboken	†70	1 30	1 15	40
Hudson	....	....	1 35	....
Jersey City	70	1 25	1 15	40
Lynn, Mass	....	..	....	†1 00
Middletown	....	....	....	1 00
Mystic	....	....	....	....
Newark	71	...	1 30	....
New Bedford	1 15@1 25	1 40	1 40	80
Newburyport	1 30	1 60	1 55	1 00
New Haven	1 00	1 35	1 35	55
New London	1 20	1 35	1 35	65
Newport	1 15@1 25	....	....	80
New York	1 00†	1 30	1 25	40
Norwalk	1 00	1 50	..	60
Norwich	1 20‡	....	1 40	70
Pawtucket	1 25‡	....	....	....
Philadelphia	....	....	...	....
Portland	1 25	1 40	1 40	90
Portsmouth, N. H.	1 30@1 40	1 60	1 60	1 00
Providence	1 15@1 25	1 40	1 35	80
Poughkeepsie, N. Y.	....	....	....	....
Rockport	....	....	....	....
Saco	....	....	....	....
Sag Harbor	....	....	....	1 00
Salem, Mass	1 25@1 35	1 45	1 50	90
Salisbury Pt., Mass.	....	....	....	...
Stamford	*70	....	....	60
Stonington	....	....	....	80
Taunton	...	...	....	...
Troy	†80	....	....	..
Warren, R. I	....	....	....	80
Wareham	....	....	1 45	....
Weymouth	...	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the Mines to Cumberland and State Line (say an average of 20 miles), the legal charge is 2 cents per ton of 2240 lb. per mile.

From State Line to Amboy (346 miles) $4 per ton of 2000 lb. On coal shipped beyond this point there is a drawback of 75 cents per net ton.

From Cumberland to Baltimore (178 miles) $2.02 per ton of 2240 lb., or $1.80 per net ton (¼ cent per ton per mile for use of hoppers over C. & P. RR.).

From Cumberland to Georgetown (152 miles) by canal, $1.10. Tolls, 46 cents.

From the Mines to Piedmont, 4 cents per ton of 2240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 10 miles.

From Piedmont to Baltimore (206 miles) $2.34 per ton of 2240 lb., or $2.08 per net ton.

From Osceola to Greenwich, Phila (say 248 miles) per T. & C. RR., per ton bituminous coal of 2000 lb., less drawback of $1.46. $2.15; rate per gross ton, $2.60.

From Osceola to South Amboy, N.J., (317 miles) per 2000 lb., $4.03, less drawback, $1.03; rate per net ton, $3; add 12 per cent. for gross ton, 36 cents, terminal expenses, shipping, 90 cents; rate per gross ton, $3.56.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, July 21, 1876.

American Pig.—We only learn of a sale of 1,500 tons of Port Orun iron on private terms, which takes out of the market all of this brand, the furnace having blown out. Although business is exceedingly quiet, there appears to be some firmness among makers, which is the result of a decreased number of furnaces being in blast. There is a general belief that prices will go still lower, but this cannot take place until reductions have been made in the prices of coal and freights, which seem now inevitable, and are likely to be made much earlier than has been anticipated. There are no inducements for the majority of furnaces now out of blast to re-light, nor will there be any until a permanent revival of business sets in. So long as the existing depression exists, the competition among sellers will be so great that the margin of profit will be no greater than at present, however great the concessions in the prices of freights and coal may be. We quote No. 1 foundry at $22; No. 2, $20; and gray forge at $19@$20.

Scotch Pig.—There is no business worthy of note doing in this article. Iron is being forced into store for want of purchasers. We quote nominally as follows: Coltness, $30; Glengarnock, $28@$29; and Eglinton $27.

MESSRS. JOHN E. SWAN & BROTHERS, Limited, of Glasgow, under date of July 7, report 116 furnaces in blast, as against 117 a year previous; 66,191 tons of pig iron (an increase of 1,090 tons for the week) in CONNAL & Co.'s stores, as against 33,089 tons at the corresponding date in 1875; shipments for the week ending July 1, 9,584 tons as compared with 14,101 tons for the corresponding week last year, showing a decrease since Dec. 25, as compared with the like period of 1874-5, of 47,385 tons; quotations of No. 1 pig iron as follows: Gartsherrie, 64/; Coltness, 68/6; Summerlee, 61/; Langloan, 67/6; Glengarnock, 62/6; and Eglinton, 56/6; quotations of freights as follows: to New York, 2/6; Boston, 9/; New Orleans, 5/; Baltimore, 8/; Philadelphia, 7/6; Montreal, 5/; and San Francisco, 22/6.

Rails.—We are reported a sale of 2 000 tons of steel, on private terms to the Pacific Railroad. We quote iron rails at mills at $39@$42, and steel at $56@$61.

Old Rails.—We are reported sales aggregatio 400 tons of old rails at $21.50.

Scrap.—There is no business reported in this article. We quote at from $27@$28 from yard.

Philadelphia Iron Trade.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE, COX, JR., & Co., Iron Merchants, 333 Walnut street Philadelphia. Week ending July 20, 1876

THE iron market remains in the same lifeless condition that has been the chief feature for some weeks. The demand is mainly for No. 2 and Gray Forge, which are comparatively scarce. The stocks of iron on hand are mainly No. 1, and with the Montgomery, St. Charles, Allentown, and several other furnaces recently out, and others going out, the consumers of Forge iron will wake up to the importance of securing stock for the early Fall trade, will, it is thought, make some advance in price. We report sales of 500 tons Crane at $20; 300 tons Montgomery at $20, cash; Forge iron, 200 tons; No. 1 Crane at quotations, and about 100 tons No. 1 St. Charles, and Chickies are one dollars a ton above other irons. We quote No. 1. $22 to $24.50; No. 2, $20 to $20.50; Gray Force, $20 to $21.

BAR IRON.—Business is very depressed; all the mills in this vicinity have started up on the accumulated orders of the last two weeks, but nothing of importance coming in. We quote 2 3-10 to 2 35-100 to hand.

RAILS.—The demand is rather quiet for new rails. We quote, $39 to $42.

OLD RAILS dull of sale. We quote, $21.50 to $23.50. Separate sales of 100 tons at $23.50 delivered at mill, equivalent to about $21.5c at the sea-board.

Baltimore. July 19, 1876.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market continues dull, with very light transactions. Prices unchanged. We quote:

Baltimore Charcoal	$30@35	Anthracite No. 3	$20@21 00
Virginia Charcoal	28@34	Mottled and White	17@19 00
Anthracite No. 1	23@24	Charcoal C B. Blooms	65@67 50
" No. 2	21@22	Refined Blooms	50@55

Boston. July 15, 1876

PIG has had a small inquiry, but for small lots on each purchase, chiefly of No. 1 for machinery purposes. The market continues to quote in a sort of irregular way with very little strength visible, notwithstanding the brokers' circulars and furnace reports have a tone in them of more confidence, and an impression reflected of firmness.

We quote nominally No. 1 from $24 to $27, No. 2 $22 to $24, and gray forge $20 to $23.

BAR continues to sell in a jobbing way with a nominal steadiness, quoting $50@52 50 on large cash machine-shop orders and 2¼@2 3-5c on blacksmiths' bills.—*Commercial Bulletin.*

Chattanooga, Tenn. July 18, 1876.

Specially reported by J. F. JAMES pig iron broker, etc., 233 Market Street.

The usual four months is given on quotations below:

Tenn. Ala. and Ga.	Charcoal, No. 1 foundry	$21@ 22	
" " "	No. 2 foundry	20@ 21	
" " "	gray forge	17@ 18	
" and Georgia coke,	No. 1 foundry	18@ 19	
" " "	No 2 foundry	17@ 18	
" " "	gray forge	15@ 16	
White and Mottled		—	
Tennessee and Georgia cold-blast car wheel		24@ 25	
Alabama	"	24@ 25	
Old Rails		cash 22 00	
Cast Scrap		" 12	
Wrought Scrap		" 16	

Cincinnati. July 18, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

We have no change to report in our market.

CHARCOAL.

Hanging Rock, No. 1 Foundry	$24 00@25 00	—4 mos	
" No 2. "	23 00@	—4 mos	
" Mill	21 00@22 00	—4 mos	
Tennessee, No. 1, Foundry	23 00@24 00	—4 mos	
Tennessee, No. 2, "	22 00@23 00	—4 mos	
" Mill	21 00@22 00	—4 mos	
Missouri, No. 1, Foundry	@	—4 mos	
STONE COAL.			
Ohio, No. 1, Foundry	22 50@	—4 mos	
" No. 2, "	21 00@21 50	—4 mos	
Ohio Mill	19 5 @20 50	—4 mos	
Missouri, No. 1 Foundry	25 00@	—4 mos	
" No. 2, "	24 00@25 00	—4 mos	
" Mill	23 0 @24 00	—4 mos	
CAR-WHEEL.			
Hanging Rock, C. B	40 00@45 00	—4 mos	
Tennessee "	28 00@ 32 00	—4 mos	
Missouri "	32 00@35 00	—4 mos	
Alabama "	27 00@32 00	—4 mos	
BLOOMS.			
Charcoal	60 00@ 75 00	—cash	
SCRAP IRON.			
Cast	50c.@ 8	—cash	
Wrought	1 00@1 40	—cash	

Cleveland, Ohio. July 18, 1876.

Messrs. C. E. BINGHAM & Co., quote as follows:

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	27 00@	
No. 2. " " "	26 50@	
No. 1 Anthracite	25 50@	
No 2, "	23 00@	
No. 1, Bituminous	25 0 @	
No. 2, "	23 00@	
American Scotch, No. 1, Cherry Valley	27 00@	
" " B—1, " "	26 00@	
" " No. 2, " "	24 00@	
No. 1, Massillon	26 50@	
B—1, "	25 00@	
No. 2, "	22 00@	
CAR WHEEL AND MALLEABLE IRON.		
No. 3 Lake Superior Charcoal	27 50@	
No. 4 " "	27 50@	
Nos. 5 and 6 "	27 50@	
BESSEMER IRON.		
Nos. 1 and 2 Lake Superior Charcoal	27 00@	
FORGE IRON.		
No. 1, Gray	22 00@	
White and Mottled	20 50@	

Louisville. July 18, 1876.

Specially reported by Messrs GEORGE H. HULL & Co.

The market is without change. Consumers still adhere to the hand to mouth policy, and their stocks in consequence are small. With few exceptions the stock in first hands is also small, so that when trade does become active it must almost necessarily cause an advance in prices.

The usual time, four mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No. 1 Foundry, from Hanging Rock Ores	$24 00@26 00
No. 2 " " "	22 00@23 00
No. 1, Mill, from " "	20 00@21 00
No. 1, Foundry, from Alabama, Georgia and Tennessee ores	22 00@23 00
No. 2, Foundry, from Ala., Geor'a and Tenn. ores	21 00@22 00
No. 1, Mill, from " " " "	20 00@21 00
HOT BLAST—STONE COAL AND COKE.	
No. 1, Foundry, from Hanging Rock Ores	22 00@23 00
No. 2, " " " "	21 00@22 00
No. 1, Mill, " " " "	20 00@21 00
No. 1, Foundry, from Ala. Ga. and Tenn. Ores	22 00@23 00
No. 2, " " " "	20 00@21 00
No. 1, Mill, " " " "	19 00@20 00
No. 1 Foundry, from Missouri Ores	— @ —
No. 2 " " "	— @ —
No. 1 Mill, from Missouri Ores	24 00@25 00
COLD BLAST—CHARCOAL.	
Car Wheel from Hanging Rock Ores	35 00@40 00
" " Tennessee "	28 00@30 00
" " Alabama and Georgia Ores	28 00@38 00
" " Kentucky Ores	28 00@38 00

Milwaukee. July 18, 1876.

Iron remains much the same—sales small.

per ton of 2 240 lb.

Frankfort L. S. Charcoal, No 1		$28 00
" " " No. 2		27 00
" " " No. 3, 4 & 5		25 00
" " " No. 6		25 00
Mil. Anthracite L. S., No. 1		27 00
" " " No. 2		26 00
Wisconsin Iron, No. 1		26 00
Mahoning Valley Bit's No. 1		32 00
" " " No. 2		30 00

Pittsburg, Pa. July 19, 1876.

Specially reported by A. H. CHILDS.

No. 1 Foundry	24@25—4 mos.
" 2 "	22@23 "
Gray Forge	21@22 50 "
White and Mottled	8@20 "
Warm blast Charcoal	23@ 30 "
Cold blast Charcoal, Western	40@45 "

Richmond, Va. July 17, 1876.

Reported by ASA SNYDER, Esq.

Charcoal pig iron is dull and the market weaker, although as yet sales have not been made below quotations.

Virginia Cold Blast Charcoal Pig Iron		$27 to $33
" Warm " " "		24 to 28
" " " Coke " "	No. 1 X	23 to 24
" " " " "	2 X	21 to 22
" " " " "	3 "	20 to 21
" Anthracite	1 X	— to —
"	2 X	— to —
"	3	— to —

San Francisco, Cal.

From the *Commercial Herald*, July 13, 1876.

The *Australia* from Sydney brought 804 ingots block tin. Arrivals of pig iron from Oregon continue to come forward in limited quantities, the price obtainable about the same as No. 1 Scotch, say $30@32.50. The stock of pig iron is now very considerable, thought to be nearly double that of last year at this time, and the market correspondingly dull. Tin plate is in excessive stock; imports since January 1st, 105,000 bxs one fifth more than for same period the year previous; prices rule low. The Selby Lead Works continue to turn out large quantities of pig, sheet and bar lead, also lead pipe and drop shot in quantities; prices remain the same as for a long time past.

St. Louis.

July 18, 1876.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Market very dull, demand light. Prices remain the same and prospects good for an advance in some grades.

Mo. Stone Coal No. 1 Fy.	$25@26	Massillon Iron, A No	1.29@30
" " " 2 "	23@24	" " B "	1.3.@—
" " Gray Mill,	22½@23	" " "	2.2@—
" Charcoal No. 1, Fy.	23@24	Cold Bl. Car Wheel, Mo.	30@33
" " " 2, "	22@23	" " " Tenn.	30@33
" " Gray Mill,	22@23	" " " Ala.	30@33
Tenn. " No. 1, Fdy	23@24	" " " H. R.	33@35
" " " 2, "	22@23	Mo. Charcoal Blooms..	50@65
" " Gray Mill	22@23	" Scrap "	45@55
Va. Coke, No. 1, Fdy.	24@25	" " hammer-	
" " " 2, "	23@24	ed Billets	75@80
" "Gray Mill,	21@23	Assorted Bar Iron 2 50, 60 days	
H. R. Char. No. 1, Fdy.	25@26	No. 1 Wrought Scrap 9cc. cwt.	
" " " 2, "	24@25	Heavy cast " "	
" " Gray Mill,	24@25	Light " "	50

Montreal.

July 11, 1876.

We continue to quote: Pig iron Eglinton and Clyde $19@20.00; Carnbroe $20 00@21 00; American $22@24; Summerlie and Calder $20@21; Langloan and Gartsherrie $21@22; Coltness $21.50@22.00; Hematite $27@28. Bar, per 100 lb., Scotch and Staffordshire, $2.10@2.20; best do., $2.30@2.40. Swedes and Norway $4.75@5.50; Low Moor and Bowling, $6.50@7.—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING, July 14, 1876.

THERE is not enough business doing in some articles to indicate the actual prices at which sellers would dispose of their goods. Metals are not being forced, and the whole list is fairly steady.

ERNEST W. S. MURRANT, ESQ., of London, under date of July 7, says: "The apprehensions as to the future course of Trade which existed at the commencement of the past month, appear to have had only too good a foundation; a considerable falling off in values is again apparent, and the volume of Trade in the Empire is sensibly decreasing."

Gold Coin.—During the week under review gold has ranged from 111⅜@111⅞, and closed at 111⅞.

Bullion.—Silver shows a still further advance, the London market standing 49d., while in this market the quotations range from 107⅛@109. Gold bars unchanged at par to ¼ per cent. premium.

Copper.—The sales during the week under review have been entirely in a small way at 20c.@20¼c. The closing price is 20c., with 19¾c. bid. Neither buyers nor sellers are numerous.

MR. MURRANT says of copper:—"In Chili the lower range of prices, which was pointed to in last month's sheet, has appeared, the 'Wallaroo' going at a trifle only over £78, while bars have been sold, at least in the Committee's Report, as low as £73. The present state of affairs in this metal, as with tin, may be mainly attributed to the fall in the value of silver, and the utter absence of speculation, except, perhaps, for a fall, and which latter has been pretty well justified by the event."

According to Messrs. VIVIAN, YOUNGER & BOND, the quantity of Chili bars, ores, ores and regulus in stock at, and afloat for, Liverpool, Swansea and Havre, and of English and foreign copper in London, is thus estimated in fine copper:—

	1st July, 1876.	1st June, 1876.	1st July, 1875.
Stock	24,104	20,791	23,135
Chili produce shipping and afloat per mail advices	6,850	8,700	6,300
Total ..... Tons	30,954	29,491	29,435

Tin.—Straits is quoted in London to-day, at £73 10/. In this market there is but very little business doing, with offers at the following: Straits, 16¾c.@17c.; L. & F., 17c.; and Banca, 21⅛c. There are some who are quoting at about ¼c higher.

MESSRS ROBT. CROOKS & Co. of Liverpool under date of July 6, says:—"The situation of the market is becoming critical. About a dozen makers have definitely closed, rather than accept present rates; as many more must follow the example for a different reason. Buyers still hold back their orders for almost every description, the only exception being Coke Tins, on which there has been somewhat of a run, with the result of raising figures for this particular quality 6d to 1s above lowest figures touched. Almost all the cheaper sellers of these are now well booked ahead. Charcoal Ternes have also experienced a better demand, though not quite to the same extent."

Messrs. VIVIAN, YOUNGER & BOND, of London, under date of July 6, say of this article:

"Foreign was steadily maintained at 73/6 to 74/ during the month, and when it was known that the deliveries from Holland were 8,600 tons (Banca and Billiton), with 1,600 tons foreign from warehouse here, the market became animated, up to 75/6 being paid both spot and forward. These continued large deliveries, with the prospect of smaller receipts of foreign during the next two or three months, seem to have settled for the present the question of a lower range of prices, but the continuous sale of Banca tin in Holland, and the large stock remaining in London, in conjunction with a somewhat uneasy feeling lest the deliveries may not be bonafide, will probably prevent any important improvements in values at present.

The Dutch Trading Company have announced that 29,900 slabs Banca will be offered at auction on the 26th inst.

The stock of foreign tin in London and Holland is thus estimated:

	1876. 1st June.	1876. 1st July.	1875. 1st July.
	Tons.		Tons.
Foreign tin in London	7,454	7,041	6,127
Banca tin in Holland	1,376	822	457
Ditto (in company's hands)	1,394	1,786	2,654
Billiton tin in Holland	1,000	1,125	700
	11,224	10,774	9.938
Quantity of tin afloat for Europe	3,400	3,400	3,700
Quotations on the same dates being for Straits	£74	£73 10/	£82

Tin Plates.—There has been a fair amount of business done in these. Quotations are very irregular. The following are the more general ones, although considerably lower prices are named: Charcoal tins, $7.25@$7.50, and ternes $6.75; coke tins, $6.25@$6.50, and ternes $6, prices in gold per box.

Mr. MURRANT says: "Great interest has been evinced in the excessive deliveries from London stock during June, and at last it leaked out that about 500 tons of Australian had been shipped to Holland on the sly, where there is already about 1,000 tons of this stuff in private warehouses; so that this makes about 1,500 tons extra stock in Holland which does not come into the published statistics. It is not necessary to state here who the purchaser of this large quantity of tin is, or for what purpose it is intended; but it is sufficent to point out that there are still 7,000 tons in stock here, a further reduction in which would be a 'consummation devoutly to be wished.'"

Lead.—The business of the week under review has not aggregated over 100 tons. There appears to be a difference between the views of buyers and sellers, the former offering but 7c. currency, while the latter are holding at 7·15c.

Spelter and Zinc.—Domestic spelter is very good at 7¼c. currency. Sheet zinc lacks activity at 8¼@8¾c. gold.

Antimony is only in moderate demand at 15¾c@16c. gold.

Quicksilver.—The London market has declined to £7 15/ per flask, while here the price is 50c.@52c. gold, per lb., and in San Francisco, 49c.@47c.

The San Francisco *Commercial Herald* says of Quicksilver: "At the close of June a round lot of 500 flks. was taken for export to Hongkong, per *City of Peking*, at 45c. Since then a few small sales have been made at 46c. This year shows a very large development and a corresponding increase in the export requirement. The low prices ruling evidently causes an increased consumption both at home and abroad. The Sulphur Bank Quicksilver Company is producing largely and seemingly has the market under its control, both present and prospective. Some of the smaller and less productive mines have been compelled by low prices to close operations and other large producers do not seem disposed to extend their operations so long as prices are constantly tending downward. The steamship *City of Peking* sailed for Hongkong, July 1st, with 675 flasks, and since that date very little business has been done; stocks allowed to accumulate. In our next issue we will give our usual six months' summary of receipts and exports, which will show a very large increase of business, while the price has fallen in six months 17¼c. per pound.

Our exports by sea for June, 1875–6, were as follows:

To	1875 Flasks.	1875 Value.	1876 Flasks.	1876 Value.
China	1,721	$86,547	3,611	$144,459
Japan	77	3,921	70	2,790
Mexico	295	14,636	710	28,175
Australia	90	4,475	185	7,277
South America	55	3,000	107	4,477
Victoria	4	198	....	....
New York	....	....	100	3,825
Central America	4	209	....	....
Total	2,246	$112,977	4,783	$191,003

FINANCIAL.

New York Stocks.

FRIDAY EVENING, July 21, 1876.

THE total sales of stocks, which we quote, for the period under review, have amounted to only 11,450 shares, being a decrease of over 20,000 shares from the business of the previous week. The general condition of the market is as dull as it well can be, the excessive heat of the weather making itself felt in this as in other markets.

New Jersey Central Railroad.—Transactions in this stock aggregate a total of 7,625 shares the dealings being pretty evenly distributed over the six days. We note a slight improvement in the quotations during the week, and an advance of ⅜ at the close.

Delaware, Lackawanna, and Western Railroad.—This stock closes a little off from the price recorded in our last, with a generally steady feeling, and lessened sales, amounting to about 13,000 shares.

Delaware and Hudson Canal Company is lower by 3 points, the total transactions for the six days being limited to only 98 shares. The extreme in ranges the quotation being represented by 102@104, and 103¾ as the final price.

Mariposa Land and Mining Company.—200 shares of this stock has changed hands at $8 per share. The mills are running ten stamps on gold ores from the tunnel, which have accumulated during the past month. An upraise shaft has been started from the 1,085-feet point to prospect the vein, to increase the ore supply, and to secure ventilation. It is stated the ore coming out of the south drift contains traces of tellurium.

Bonds.—Transactions in these have been restricted with no change worthy of note in the quotations.

The National Tube Works Company of Boston, announces a dividend of 4 per cent. payable on demand.

Chesapeake and Ohio Canal. A new outlet from this canal to the Potomac River at Georgetowd D. C. has been completed. The elevation to be overcome is about 40 feet, and in order to avoid the use of several locks, an inclined plane has been constructed upon which runs a large, caisson, which, with water and boat, weighs 350 tons, is supported on trucks, and is raised and lowered by water power.

Scioto Valley. The survey of the extension from Chillicothe, O., to Portsmouth is nearly completed. The engineers are also running a line for a branch from Circleville southeast to some coal mines a few miles distant.

North Chicago Rolling Mill Company.—The annual meeting of the stockholders of this company was held on the 15th inst., and the following officers elected for the ensuing year: O. W. POTTER, President, Chicago; S. CLEMENT, Treasurer, Waukegan; R. C. HANNAH, Secretary, Chicago. Directors S. P. BURT, New Bedford, Mass.; S. CLEMENT, Chicago; O. W. POTTER, Chicago.

The President's report was somewhat lengthy, and showed that notwithsianding the late financial depression the affairs of the company were in a favorable condition. No dividend will, however, be paid, but the earnings carried to the surplus account, which is now over $500,000. The disbursements for the year ending July 1 amounted to $3,747,719 12, and the product was 42,638 gross tons of steel rails, 19,154 gross tons of iron rails, or 61,792 tons of both kinds, and 34,389 gross tons of pig iron.

Quotations and Sales of Stocks and Bonds.

For the week ending July 21, 1876.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	240	—
Consolidation Coal Co	—	—	39¼	—
Spring Mt. Coal Co	—	—	55	100
American Coal Co	—	—	*54	—
Maryland Coal Co	—	—	†20	—
Del., Lack., and West. RR. Co.	102⅛	101⅛	101¼	3,327
New Jersey Central RR. Co.	73	71¾	72⅛	7,625
Delaware and Hudson Canal Co.	104	102	103¾	98
Quicksilver Mining Co. pref'd.	—	—	10	—
" " " Common.	—	—	10	—
Mariposa Land & Min. Co. pref'd.	—	—	8	100
St. Louis & Iron Mountain RR.	—	—	—	—
Lehigh & Wilkes-Barre Coal Co.	—	—	—	—
Total Shares sold				11,450
Sales for the week previous				31,748
Decrease				20,298

* Nominal. † Asked.

BONDS.

	Inter'st	Sales.	Price.
Del., Lack. & West. 2d M.	M. & S.	.....	.... @ ....
" " " 7's Con'ble	J. & D.	.....	.... @ ....
Cent'l RR. of N.J., 1st M., New	F. & A.	.....	.... @114½
" " " 1st Cons.	.....	1,000	.... @101⅛
" " " Convert'le	M. & N.	10,000	.... @ 95
Lehigh & W.-B'e, Con. Guar'd.	.....	71,000	87¼@ 87⅝
Am. Dock & Imp. Mt. Bonds.	J. & J.	.....	.... @ 96½
Del. & Hud. Can., 1st M., 1891	.....	1,000	.... @110¼
" " " 1884	.. ....	.....	.... @ ....
" " " 1877	.....	.....	.... @ ....
" " " Coup. 7's, 1894	.....	10,000	.... @110
" " " Reg'd 7's, 1894	.....	.....	.... @ ....
St. L. & Iron Mountain, 1st M	F. & A.	.....	.... @ ....
" " " 2d M	M. & N	.....	@*79
Chesapeake & Ohio 6's, 1st M.	.....	.....	.... @ ....
" " Ex. Coupon	.....	.....	.... @ ....
Mariposa Gold Loan con. 7s.	.....	.....	.... @*100¾
Total sales		$93,000	

* Nominal.

Philadelphia Stocks.

PHILADELPHIA, Thursday Evening, July 20, 1876.

THE week's transactions in this market have amounted to nearly 30 000 shares, which is a slight increase over the sales reported in our last. Prices in the majority of instances have been well maintained.

Pennsylvania Railroad—19,550 shares of this stock has changed hands at from 52⅛ to 52⅞ as the extreme figures, the final price being 52⅝, the same as recorded in our last.

Lehigh Valley Railroad.—Quotations in this stock have not changed sufficiently to call for special comment. 624 shares represent the total sales.

Reading Railroad has declined a fraction with sales amounting to nearly 5,000 shares at from 44 to 44½.

Lehigh Coal and Navigation Company.—This stock closes ¾ higher, with 4,307 shares as represented in the transactions.

Bonds.—We note a slight increase in the bond transactions with but little variation in prices.

Auction Sales of Stocks and Bonds for the week have been as follows.

Emaus Iron Company 18,000 7 per cent. Coupon bonds at 1 per cent.

Moshannon Coal Company 2,600 shares at $1.25 per share.

Danville, Hazleton and Wilkes-Barre Railroad Company $2,000 1st mortgage 7 per cent. Coupon bonds at 27½ per cent.

The Mill Creek and Minehill Navigation and Railroad Company announces a dividend of *five* per cent. payable on demand.

The Schuylkill Navigation and Railroad Company announces a dividend of *two and a half* per cent. payable on demand.

The Mount Carbon and Port Carbon Railroad Company announces a dividend of *six* per cent. payable on demand.

The North Pennsylvania Railroad Company announce a semi-annual dividend of 3 per cent clear of taxes, upon the capital stock of the company, payable August 1.

The Diamond Coal Company announce a dividend of *one dollar* per share, payable on demand.

Lewisburg Centre and Spruce Creek Railroad Company. A special meeting of this company will be held on the 25 inst. for the purpose or taking action upon a proposed lease to the Pennsylvania Railroad Company.

Quotations and Sales of Stocks and Bonds,

For the week ending July 20, 1876.

STOCKS.

	Highest	Lowest	Closing	Shr's
Lehigh Valley RR. Co	57¾	57¼	57⅝	624
Pennsylvania RR.	52⅞	52⅛	52⅝	19,650
Reading RR.	44½	44	44⅛	4,696
Lehigh Coal and Nav. Co	44⅞	43¾	44⅜	4,307
Penn. Canal	—	—	*9	—
Buck Mountain Coal Co.	—	—	*25	—
Fulton Coal Co	—	—	*3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co	—	—	85	—
St. Nicholas Coal Co	—	—	*1	—
Cambria Iron Co	—	—	15¼	—
Crane Iron Co	—	—	*25	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	70¼	—
Total shares sold				29,277
Sales for the week previous				27,736
Increase				1,541

* These quotations are nominal.

BONDS.

	Sales.	Price
H and B. T. RR. 1st mortgage, 7s	—	— @107½
" " " 2d " "	—	— @105
" " " 3d " cons	—	— @ 43
Lehigh Valley RR. Con. mtg. 6s	57,000	99¼@ 99⅝
" " " 7s, 1910	1,000	— @113⅛
" " " 6s Reg.	1,000	— @108½
" " " C. M. 6s 1923	—	— @ 99⅛
Pennsylvania RR., 1st mtge. 6s	6,000	— @104¾
" " gen. " cou. 1910	12,000	— @103¾
" " gen. " 6s, reg.	1,000	— @106
" " Cons. M. 6s reg.	—	— @ 98
Phil. & Reading RR. 7s '93	—	— @107⅛
" " G. M. 7s, reg.	3,000	195¾@106
" " " " 7s cou.	—	— @106¾
" " new convertible 7s	100	— @ 98¼
" " 6s 1880	—	— @105½
Phil. & Reading C. & I. Co. Deb. 7s	—	— @—
" " Locust Mount. tract	—	— @ 80
Lehigh Coal & Nav. Co., 6s '84	500	— @103
" " " RR. 6s, '97	12,100	— @104¼
" " " cov. m. 7s	—	— @—
" " " 6s gold loan	6,500	— @103¼
Penn. Canal, 6s	1,000	— @ 72¾
Penn. and N. Y. Canal, 7s	4,000	— @109
Ches. and Del. Canal, 6s	900	— @ 86
Susquehanna Canal, 6s	—	— @ 74
Delaware Division Canal, 6s	—	— @—
Susquehanna Coal Co. 6s	—	— @ 77
Buck. Mount Coal Co. 6s	—	— @—
Penn. Gas Coal Co. 6s	—	— @—
Honeybrook Coal Co. 7s	—	— @—
Total amount of sales	$106,100	

Closing quotations, in the absence of sales, represent the latest prices bid.

Gold and Silver Stocks,

NEW YORK, FRIDAY EVENING, July 21, 1876.

We note an improved feeling in the San Francisco Mining Share market, and a recovery in many of the prominent stocks. While some items on the list continue to decline, the bulk of the quotations exhibit an improvement.

Consolidated Virginia.—This company was compelled to draw on its surplus to the extent of $471,000 for the payment of the June dividend, the bullion product of the month amounting to only $609,000. The surplus of this company must be enormous, and is ample for this and many more such calls upon it.

California. The June bullion product of this mine was $1,478,000, which, after paying the dividend of $2 per share equal to 1,080,000 would leave a balance of nearly $400,000 to be carried over. We note the statement that the bullion produced by the bonanza mines, carries 60 per cent. of silver and 40 per cent. gold instead of 50 per cent. of each as formerly.

C. & C. Joint Shaft The breaking of the main pumprod of the C. & C. shaft is sadly inconveniencing the prosecution of the work in these mines; the lower breasts however are reported as looking well and yielding the usual quantity of ore.

Gould and Curry.—A new fan has been placed in the old Gould and Curry tunnel. It is driven by two powerful steam engines. The air is all drawn from the Gould and Curry, Best and Belcher, and Consolidated Virginia mines by this means, and is replaced by fresh air from the surface coming down through all the shafts. The temperature of the three mines has been reduced in consequence from about 130 to 90 degrees.

Chollar Potosi, for the fiscal year ending June 1, reduced 17,728 tons ore, showing an average value of $18.03 per ton, the expense of mining and reducing being $16.03.

Ophir shows a bullion production of $279,000 for the month of June

The Eberhardt and Aurora Silver Mining Company have declared a dividend of 5/ per share.

The Sutro Tunnel was in, on the 8th inst., 13,698 feet. It is rumored that a strike has been made in the tunnel at a point about 13,650 feet from the mouth. There is a generally expressed belief that there is some truth in the report, as mining experts have been predicting a strike there for the past two months.

The Specimen Gold Mine, California, has been opened by tunnel to a depth of 500 feet, where a fine body of rich ore is said to have been struck. The Ophir Mils have received a supply of this ore, and will soon start on the same.

QUOTATIONS:

	No. of feet on Vein.	No. of shares.	July 13.	July 20.
Sierra Nevada	3,300	100,000	$13	$14
Union Consol'd.	600	100,000	10	11
Mexican	600	108,000	27	29
Ophir	675	108,000	49	46
California	600	540,000	66	61
Consol'd. Virginia	710	540,000	48	58
Best & Belcher	540	100,800	42	45
Gould & Curry	612	100,800	13	15
Savage	771	112,000	18	18
Hale & Norcross	400	112,000	9	8
Chollar Potosi	1,400	28,000	72	71
Alpha Consol'd	306	30,000	38	38
Imperial Con.	468	500,000	5	5
Yellow Jacket	957	120,000	27	25
Kentuck	95	30,000	13	11
Crown Point	541	100,000	9	10
Belcher	1,040	104,000	18	17
Overman	1,200	38,400	61	67
Caledonia	2,188	100,000	8	9
Justice	2,100	105,000	21	21
Raymond & Ely	5,000	30,000	9	8
Meadow Valley	4,400	60,000	1	1
Eureka Consolid.	....	50,000	12	11
Eureka G. V.	1,680	20,000	3	3
Silver Hill	5,400	54,000	7	7
Julia	3,000	110,000	6	8

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & CO., Bankers and Brokers, Room 7 Traveller Building, 31 State Street, Boston.

BOSTON, THURSDAY EVENING, July 20, 1876.

When the weather gets to that point that collars drop, it can't be expected that copper stocks will have any degree of strength, but everything considered, they hold up much better than could be expected. Allouez no sales. Calumet & Hecla is 1¾ points higher, having advanced from 164½ to 166¼. Copper Falls 3 to 3¼. Franklin firm at 10 bid. National 1¼ to 1¾. Quincy 46. Rockland ¼ bid. In the balance of the list their is nothing doing, but a few orders would very soon resurrect them. The Calumet & Hecla Mining Company has declared a dividend of $5 per share, payable August 15.

Sales for the week are comprised in the following: 186 shares of Calumet and Hecla at from $164¼ to $166¼, and 100 shares of Duncan Silver at $1.50 per share.

Description.	Par Value.	No. of Shares.	Closing. Bid.	Asked.
Allouez	$50	20 000	$ 8 00	$10 00
Calumet and Hecla	25	80,000	166 00	166 50
Central	25	20,000	30 00	31 00
Copper Falls	50	20,000	3 00	3 25
Dana	25	20,000	8	10
Franklin	25	20,000	10 00	10 50
Humboldt	25	20.000	9	11
Madisca	25	20,000	27	30
Mesnard	25	20,000	25	37½
Minnesota	25	20,000	1 25	2 00
National	15	20,000	1 25	1 50
Osceola	25	40,000	21 00	22 00
Petherick	25	20,000	40	50
Pewabic	25	20,000	3 25	4 00
Phenix	25	20,000	12 50	13 00
Quincy	25	20,000	46 00	46 25
Ridge	25	20,000	4 25	4 75
Rockland	25	20,000	25	35
International Silver	20	60,003	8	10
Star	25	20,000	40	50
Superior	25	20,000	9	12½
Duncan Silver	20	60,000	1 37½	1 50

Gas Stocks.

NEW YORK, FRIDAY EVENING, July 21, 1876.

BUT very few changes have occurred in the gas stock quotations, and the market remains in the same dull and depressed condition noted for several weeks past.

The Williamsburg Gas Company has declared a quarterly dividend of 3 per cent., payable on demand. The interest on the scrip of this company, amounting to a semi-annual payment of $35,000, was due on the 20th inst.

East Boston Gas Company.—This company declared their semi-annual dividend of 4 per cent. (instead of 5 per cent. as formerly on the 15th inst.

The New Bedford Gas Company, have declared their semi-annual dividend of 4 per cent.

The Laclede Gas Company of St. Louis, Mo., declared their regular semi-annual dividend of 5 per cent., on the 15th inst.

Marquette, Mich., Gas Company.—This company has accepted the proposition made by the City Council at its recent meeting, and the streets are again lifted from the darkness. The new arrangement saves the city a considerable sum as compared with the cost of lighting last year, and at the same time secures the burning of all the lights until 12 o'clock, midnight.

Norristown, Pa., Gas Light and Fuel Company.—40 shares of this stock par $25, were sold at auction in Philadelphia on the 18th inst., at $27 per share.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity	Cap. Stk.	Par.	last Div'd.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	3½	Jan. '76	112½	113¼
" " Bonds	900,00	1,000	†3½	Feb. '76	105	
NewYork, "	4,000,000		5	Jan. '76	136	140
Metropol. "	2,500,000	100	5	Mar. '76	150	155
" " Certf.	1,000,000	...	3½	" "	103⅛	
" " Bonds	500,000	1,000	3½	Jan. "	102	102¼
Harlem "	1.850,000	50	4	Feb. '76	118	122
Manhattan "	4,000,000	50	10	July "	235	240
Brooklyn, B'klyn	2,000,000	25	5	June '76	175	185
Nassau "	1,000,000	25	4	Jan. '76	70	78
" " Certf.	700,000	1,000	3½	Nov. '76	94	95
People's "	1,000,000	10	3½	Jan. '76	45	50
" " Certf.	30 ,000	1,000	3½	Jan. '76	85	8⅞
" " Bds	325,000	....	3½	Feb. "		95
Metropol. "	1,000,000	10	3½	Nov. '75	70	75
Wmsburgh "	1,000,000	50	5	Jan. '76	122	130
" " Certf.	1,000,000	....	3½	Jan. "	100	102
Citizen's "	1,200,000	20	2½	Jan. '76	88	90
" " Certf.	320,000	1,000	3½	April "	99	101
J. C. N.J.	386,000	20	5	July, '75	160	170
Centl. Westch. N.Y.	466,000	50	4	July, "	95	100
Subur'n " "	390,000	50				95

† Gold.

Companies out of Town.*	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C.			120	133
¶Citizen's G. L. Co., New'k. N.J.	1,095,000	50	85	90
Perth Amboy G. L. Co., N. J.		25		90
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " " "	25,000	100		100
Richmond Co., S. I. "	300,000		100	105
Citizens', Rochester, "		100	45	50
Rochester Gas Co., "		100	50	
‖People's G. L. Co. Albany, "	1,000,000	100		20
§Mutual " Buffalo "	750,000	100	48	55
Mutual " Detroit. Mich.		50	18	
TroyG. L. Co., Troy, N. Y.			108	
Citizens " " "	600,000	100		100
Brockport, N. Y., G. L. Co.	25,000	100	60	80
Saugerties G. L. Co.	15,000	100	100	115
†Baltimore G. L. Co., Balt., Md	2,000,000	100	155	165
St. Louis G. L. Co., St. Louis, Mo	600,000			100
People's G. L. Co., Balt., Md	2,000,000	25	24½	25⅜
Hannibal G. L. Co., Hanni., Mo.	100,000	100	95	100
La Clede, St. Louis, Mo	1,200,000	100		102
Lewiston G. L. Co., Lewis., Me	400,000	100	50	85
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	125⅜	
Jacksonville, Ill.	120,000	100	82	
‡Lima, Ohio	60,000	100	10	
Derby G. L. Co., Derby, Conn.	160,000	100	60	80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. LibertiesG. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			42	43
Pottsville, Pa., Gas Co.		50	40⅜	
Portland G. L. Co. Portland, Me	350,000	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	41	
Boston G. L. Co., Boston, Mass.	2,500,000	500	785	790
East Boston, Mass.		25	132	
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co, Cincin, O.				200
Carondelet G. L. Co., Mo.		50		6¼
S. F. G.L. Co. San Francisco, Cal	10,000,000	100	99¾	99½
Stillwater G. L. Co., Minn.	50,000	50		26
City G. L. Co. Montreal, Can.	1,440,000	40	167	169
Consumers G. L (old.) Tor., Ont	600,000	50	134	
Hamilton G. L. Co. Ont.	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S.	400,000	40		147¼

* These quotations represent the latest obtainable prices at which sales were made.

† This Company has issued $1,000,000 in certificates in addition to their stock indebtedness, on which they pay interest at the rate of 6 per cent. gold.

‡ This Company has $30,000 in bonds outstanding.

§ $200,000 represents the bonded indebtedness of this Company.

‖ $350,000 of the indebtedness of this company is represented by bonds.

¶ $124,000 of the indebtedness of this company is represented by bonds; also $53,000 in certificates, which is included in the aggregate stock debt quoted.